PTO/SB/123 (11-08)
Approved for use through 11/30/2011. OMB 0651-0035
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Patent

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Patent Number	7526105
Issue Date	2009-04-28
Application Number	11692430
Filing Date	2007-03-28
First Named Inventor	Mark Drange
Attorney Docket Number	EMP0031-US

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I am the:

☐ Patentee.

☑ Assignee of record of the entire interest. See 37 CFR 3.71.
Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96).

☐ Attorney or agent of record. Registration Number _____.

Signature

Typed or Printed Name Daniel Mitry

Date 5/23/2014 | Telephone

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

☑ *Total of 1 forms are submitted.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

PTO/SB/96 (07-06)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: Empire IP LLC

Application No./Patent No.: 7526105 Filed/Issue Date: 04/28/2009

Titled:

Empire IP LLC, a Corporation

(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.

states that it is:

1. [x] the assignee of the entire right, title, and interest in;

2. [ ] an assignee of less than the entire right, title, and interest in
(The extent (by percentage) of its ownership interest is _____ %); or

3. [ ] the assignee of an undivided interest in the entirety of (a complete assignment from one of the joint inventors was made)

the patent application/patent identified above, by virtue of either:

A. [x] An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel 032972, Frame 0142, or for which a copy therefore is attached.

OR

B. [ ] A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

2. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

3. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

[ ] Additional documents in the chain of title are listed on a supplemental sheet(s).

[ ] As required by 37 CFR 3.73(b)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (i.e., a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

Signature — Date: 5/22/2014

Daniel Mistry — Member

Printed or Typed Name — Title

Electronic Acknowledgement Receipt

EFS ID:	19164791
Application Number:	11692430
International Application Number:	
Confirmation Number:	7545
Title of Invention:	SECURITY ALARM SYSTEM
First Named Inventor/Applicant Name:	Mark Dronge
Customer Number:	22846
Filer:	John Kasha
Filer Authorized By:	
Attorney Docket Number:	126.107
Receipt Date:	29-MAY-2014
Filing Date:	28-MAR-2007
Time Stamp:	21:10:32
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Change of Address	EMP0031-US_chg_address.pdf	385265 28e5c8ea9099c89a3e34fbe91c8e84372793e909	no	2
Warnings:					
Information:					

Total Files Size (in bytes):	385265

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

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United States Patent and Trademark Office
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www.uspto.gov

APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/692,430	04/28/2009	7526105	126.107	7545

22846 7590 04/08/2009

BRIAN ROFFE, ESQ
11 SUNRISE PLAZA, SUITE 303
VALLEY STREAM, NY 11580-6111

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 92 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site http://pair.uspto.gov for additional applicants):

Mark Dronge, Tenafly, NJ;

IR103 (Rev. 11/05)

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

22846 7590 12/19/2008

BRIAN ROFFE, ESQ
11 SUNRISE PLAZA, SUITE 303
VALLEY STREAM, NY 11580-6111

03/19/2009 RFEKABU2 00000039 11692430

01 FC:2501 755.00 OP
02 FC:1504 300.00 OP

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

Brian Roffe	(Depositor's name)
Brian Roffe	(Signature)
March 16, 2009	(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/692,430	03/28/2007	Mark Dronge	126.107	7545

TITLE OF INVENTION: SECURITY ALARM SYSTEM

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	$755	$300	$0	$1055	03/19/2009

EXAMINER	ART UNIT	CLASS-SUBCLASS
BHATNAGAR, ANAND P	2624	382-107000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 Brian Roffe
2
3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:
- ☒ Issue Fee
- ☒ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
- ☐ A check is enclosed.
- ☒ Payment by credit card. Form PTO-2038 is attached.
- ☒ The Director is hereby authorized to charge ~~the required fee(s),~~ any deficiency, or credit any overpayment, to Deposit Account Number ~~50-1268~~ _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.
- ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature B Roffe Date MaRch 16, 2009

Typed or printed name Brian Roffe Registration No. 35,336

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

22846 7590 12/19/2008

BRIAN ROFFE, ESQ
11 SUNRISE PLAZA, SUITE 303
VALLEY STREAM, NY 11580-6111

EXAMINER	
BHATNAGAR, ANAND P	
ART UNIT	PAPER NUMBER
2624	

DATE MAILED: 12/19/2008

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/692,430	03/28/2007	Mark Dronge	126.107	7545

TITLE OF INVENTION: SECURITY ALARM SYSTEM

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	$755	$300	$0	$1055	03/19/2009

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PTOL-85 (Rev. 08/07) Approved for use through 08/31/2010.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
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INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

22846 7590 12/19/2008

BRIAN ROFFE, ESQ
11 SUNRISE PLAZA, SUITE 303
VALLEY STREAM, NY 11580-6111

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Certificate of Mailing or Transmission

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(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/692,430	03/28/2007	Mark Dronge	126.107	7545

TITLE OF INVENTION: SECURITY ALARM SYSTEM

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	$755	$300	$0	$1055	03/19/2009

EXAMINER	ART UNIT	CLASS-SUBCLASS
BHATNAGAR, ANAND P	2624	382-107000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,

(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 _____

2 _____

3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. The following fee(s) are submitted:

❑ Issue Fee

❑ Publication Fee (No small entity discount permitted)

❑ Advance Order - # of Copies _____

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❑ A check is enclosed.

❑ Payment by credit card. Form PTO-2038 is attached.

❑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)

❑ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.

❑ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/692,430	03/28/2007	Mark Dronge	126.107	7545

22846 7590 12/19/2008

BRIAN ROFFE, ESQ
11 SUNRISE PLAZA, SUITE 303
VALLEY STREAM, NY 11580-6111

EXAMINER	
BHATNAGAR, ANAND P	
ART UNIT	PAPER NUMBER
2624	

DATE MAILED: 12/19/2008

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 92 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 92 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

PTOL-85 (Rev. 08/07) Approved for use through 08/31/2010.

Notice of Allowability	Application No.	Applicant(s)	
	11/692,430	DRONGE, MARK	
	Examiner	Art Unit	
	ANAND BHATNAGAR	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *11/28/08*.

2. ☒ The allowed claim(s) is/are *1-19 and 23-25*.

3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

/Anand Bhatnagar/ Primary Examiner, Art Unit 2624	12/16/08

1. Applicant's amendment filed on 11/28/08 has been entered and made of record.

2. Applicant has amended claims 1, 5, 7-9, 11, 13, 14, and 15. Applicant has canceled claims 20-22. Applicant has added claims three new claims (#23-#25). Currently, claims 1-19 and 23-25 are pending.

Allowable Subject Matter

3. Claims 1-19 and 23-25 are allowed.

4. Applicant's arguments, see remarks pages 9-11, filed 11/28/08, with respect to claims 1 and 13 have been fully considered and are persuasive. The 35USC 103(a) rejection of claims 1-19 has been withdrawn.

5. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANAND BHATNAGAR whose telephone number is (571)272-7416. The examiner can normally be reached on M-Th 7:30am-4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on 571-272-7453. The

fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Anand Bhatnagar/
Primary Examiner, Art Unit 2624
December 16, 2008

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11692430	DRONGE, MARK
	Examiner	Art Unit
	ANAND BHATNAGAR	2624

ORIGINAL		INTERNATIONAL CLASSIFICATION	
CLASS	SUBCLASS	CLAIMED	NON-CLAIMED
382	107	G 0 6 K 9 / 00 (2006.01.01)	

CROSS REFERENCE(S)					
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)				
348	143				

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	1	20	17												
2	2	21	18												
3	3	22	19												
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5	5		21												
6	6		22												
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9	9	12	25												
10	10														
11	11														
15	12														
16	13														
17	14														
18	15														
19	16														

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	22	
/ANAND BHATNAGAR/ Primary Examiner.Art Unit 2624	12/16/2008	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	2

U.S. Patent and Trademark Office

Part of Paper No. 20081216

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BIB DATA SHEET

CONFIRMATION NO. 7545

SERIAL NUMBER	FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
11/692,430	03/28/2007 RULE	382	2624	126.107

APPLICANTS
Mark Dronge, Tenafly, NJ;

** **CONTINUING DATA** ********** verified /AB/
This appln claims benefit of 60/743,894 03/29/2006
and claims benefit of 60/804,660 06/14/2006

** **FOREIGN APPLICATIONS** ********** verified /AB/

** **IF REQUIRED, FOREIGN FILING LICENSE GRANTED** ** ** SMALL ENTITY **
04/05/2007

Foreign Priority claimed ☐ Yes ☑ No 35 USC 119(a-d) conditions met ☐ Yes ☑ No Verified and Acknowledged /ANAND P BHATNAGAR/ Examiner's Signature	☐ Met after Allowance Initials	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
		NJ	4	22	3

ADDRESS
BRIAN ROFFE, ESQ
11 SUNRISE PLAZA, SUITE 303
VALLEY STREAM, NY 11580-6111
UNITED STATES

TITLE
SECURITY ALARM SYSTEM

FILING FEE RECEIVED		
540	FEES: Authority has been given in Paper No._____ to charge/credit DEPOSIT ACCOUNT No._____ for following:	☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit

BIB (Rev. 05/07).

EAST Search History

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	2	(((camera$1 video$3) near5 (dormant$3 sleep$4 off standby wait$4 inactiv$4)) and (motion near4 detector$1) and (((obtain$4 produc$5 take taking generat$4) near4 imag$4) with motion$4)).clm.	US-PGPUB	OR	ON	2008/12/16 10:35

EAST Search History

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	14479	382/100,103,106,107,159,170,181,190, 195,203,206;348/142,143,152,155,159, 169.ccls.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/07/11 11:43
S2	1208	S1 and ((camera$1 video CCD CMOS) same (motion$4 near6 (detect$4 sensor$1)))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/07/11 11:44
S3	270	S2 and ((identif$6 verif$5 classif$7) with (animal$1 dog$1 cat$1 bear$1 human$1 person$1))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/07/11 11:46
S4	209	S3 and (secur$4 surveillan$5)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/07/11 11:47
S5	34	S2 and ((identif$6 verif$5 classif$7) with (animal$1 dog$1 cat$1 bear$1))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/07/11 11:59
S6	3270	S1 and ((camera$1 video CCD CMOS) same ((motion$4 near4 (detect$4 sensor$1)) track$4))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/07/11 12:36
S7	97960	((camera$1 video CCD CMOS) same ((motion$4 near4 (detect$4 sensor$1)) track$4))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/07/11 12:36
S8	1157	S7 and((identif$6 verif$5 classif$7) with (animal$1 dog$1 cat$1 bear$1 racoon$1))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/07/11 12:37

EAST Search History

S9	643	S8 and (secur$4 surveillan$5)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/07/11 12:40
S10	19	S9 and ("no" near5 (alarm$4 warn$4))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/07/11 12:40
S11	2	"20030202102".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/07/11 13:08
S12	0	"4679077.pn.,5283551.pn.,5473311.pn., 5576972.pn.,5748775.pn.,5864640.pn., 5963148.pn.,6532901.pn.,6782847.pn. 6864789.pn.,20040215750.pn., 20040233287.pn.,20050011466.pn., 20050151851.pn.",	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/07/11 13:27
S13	28	"4679077".pn.",5283551".pn.",5473311". pn.",5576972".pn.",5748775".pn.", 5864640".pn.",5963148".pn.",6532901".pn. ",6782847".pn."6864789".pn.", 20040215750".pn.",20040233287".pn.", 20050011466".pn.",20050151851".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/07/11 13:28
S14	2	"5328355".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/07/11 13:36
S15	3	"2005328355".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/07/11 13:37
S16	4	"9828706"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/07/11 13:38

EAST Search History

S17	12	"5328355"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/07/11 13:39
S18	319960	Ito.in.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/07/11 13:47
S19	0	S18 and "20030408".rlpd.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/07/11 13:52
S20	0	S18 and "20030408".RLPD.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/07/11 13:53
S21	65	"20030408".RLPD.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/07/11 13:54
S22	65	"20030408".RLPD.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/07/11 13:55
S23	22698	"20030408"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/07/11 13:56
S24	172	S23 and ito.in.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/07/11 13:56

EAST Search History

S25	65	"20030408".RLPD.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/07/11 13:58
S26	14692	382/100,103,106,107,159,170,181,190,195,203,206;348/142,143,152,155,159,169.ccls.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/08/25 13:33
S27	703	S26 and (securit$4 surveill$6 observa$7) and (camera$1 same (motion$4 near6 (detect$6 sensor$1 device$1)))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/08/25 13:34
S28	248	S27 and (camera$1 same ((active on record$4) and (inactiv$3 off ("not" with record$3))))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/08/25 13:36
S29	629	((detect$4 determin$5) with (animal$1 dog$1 cat$1 threat$4 danger$5)) and (securit$4 surveill$6 observa$7) and (camera$1 same (motion$4 near6 (detect$6 sensor$1 device$1)))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/08/25 13:59
S30	135	S29 and (camera$1 same ((active on) and (inactiv$3 off)))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/08/25 14:00
S31	126	((identif$6 authenticat$4 verif$6) near5 (animal$1 dog$1 cat$1 threat$4 danger$5)) and (securit$4 surveill$6 observa$7) and (camera$1 same (motion$4 near6 (detect$6 sensor$1 device$1)))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/08/25 14:12
S32	92	S31 not S30	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/08/25 14:12

EAST Search History

S33	242	"4679077" "5283551" "5473311" "5576972" "5748775" "5864640" "5963148" "65329016782847" "6864789"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/08/26 14:40
S34	252	"4679077" "5283551" "5473311" "5576972" "5748775" "5864640" "5963148" "65329016782847" "6864789" "20040215750" "20040233287" "20050011466" "20050151851"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/08/26 14:40
S35	28	"4679077".pn.",5283551".pn.",5473311". pn.",5576972".pn.",5748775".pn.", 5864640".pn.",5963148".pn.",6532901".pn. ",6782847".pn.",6864789".pn.", 20040215750".pn.",20040233287".pn.", 20050011466".pn.",20050151851".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/08/26 14:43
S36	932	takaiwa.in.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/08/26 14:48
S37	0	S36 and "5328355"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/08/26 14:48
S38	1	S36 and "05328355"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/08/26 14:49
S39	0	"199828706"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/08/27 10:21
S40	0	"wo9828706"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/08/27 10:21

EAST Search History

S41	471	wootton.in.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/08/27 10:21
S42	15413	382/100,103,106,107,159,170,181,190, 195,203,206;348/142,143,152,155,159, 169.ccls.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/12/16 09:56
S43	562	S42 and ((camera$1 video$3) nera5 (dormant$3 sleep$4 off standby wait$4)) and (motion near4 detector$1)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/12/16 09:59
S44	113	S42 and ((camera$1 video$3) near5 (dormant$3 sleep$4 off standby wait$4)) and (motion near4 detector$1)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/12/16 09:59
S45	65	S44 and ((obtain$4 produc$5 take taking generat$4) near4 imag$4)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/12/16 10:03
S46	20	S44 and (((obtain$4 produc$5 take taking generat$4) near4 imag$4) with motion$4)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/12/16 10:04
S47	462	((camera$1 video$3) near3 (dormant$3 sleep$4 off standby wait$4)) and (motion near4 detector$1)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/12/16 10:12
S48	16270	((camera$1 video$3) nea53 (dormant$3 sleep$4 off standby wait$4)) and (motion near4 detector$1)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/12/16 10:12

EAST Search History

S49	645	((camera$1 video$3) near5 (dormant$3 sleep$4 off standby wait$4)) and (motion near4 detector$1)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/12/16 10:12
S50	90	S49 and (((obtain$4 produc$5 take taking generat$4) near4 imag$4) with motion$4)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/12/16 10:12
S51	70	S50 not S46	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/12/16 10:13
S52	2	(((camera$1 video$3) near5 (dormant$3 sleep$4 off standby wait$4 inactiv$4)) and (motion near4 detector$1) and (((obtain$4 produc$5 take taking generat$4) near4 imag$4) with motion$4)).clm.	US-PGPUB	OR	ON	2008/12/16 10:35
S53	2	(((camera$1 video$3) near5 (dormant$3 sleep$4 off standby wait$4 inactiv$4)) and (motion near4 detector$1) and (((obtain$4 produc$5 take taking generat$4) near4 imag$4) with motion$4)).clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/12/16 10:37
S54	91	(((camera$1 video$3) near5 (dormant$3 sleep$4 off standby wait$4 inactiv$4)) and (motion near4 detector$1) and (((obtain$4 produc$5 take taking generat$4) near4 imag$4) with motion$4))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/12/16 10:37

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11692430	DRONGE, MARK
	Examiner	Art Unit
	ANAND BHATNAGAR	2624

SEARCHED			
Class	Subclass	Date	Examiner
382	100,103,106,107,159,170,181,190,195,203,206	08/27/08	/AB/
348	142,143,152,155,159,169	08/27/08	/AB/
Text	see sheet	08/27/08	/AB/
updated	see sheet	12/16/08	/AB/

SEARCH NOTES		
Search Notes	Date	Examiner
EAST	08/27/08	/AB/
Inventor	08/27/08	/AB/
IEEE	12/18/08	/AB/

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner
Interference	see sheet	12/16/08	/AB/

12/16/08	/ANAND BHATNAGAR/ Primary Examiner.Art Unit 2624

Attorney Docket No. 126.107

UNITED STATES PATENT AND TRADEMARK OFFICE

Examiner: Anand P. Bhatnagar		Art Unit: 2624
Re:	Application of:	Mark Dronge
	Serial No.:	11/692,430
	Confirmation No.:	7545
	Filing Date:	March 28, 2007
	Title:	Security Alarm System
	Customer Number:	22846

AMENDMENT

Mail Stop Non Fee Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

November 28, 2008

Dear Sir:

In response to the Office Action dated August 28, 2008, which set a shortened three-month statutory term for response expiring on November 28, 2008, please amend the above-identified application as follows.

Amendments to the Specification begin on page 2 of this paper

Amendments to the Claims are reflected in the listing of claims which begins on page 3 of this paper.

Remarks/Arguments begin on page 9 of this paper.

AMENDMENTS TO THE SPECIFICATION

Please amend the paragraph in the specification beginning at page 1, line 2 as follows:

This application claims priority under 35 U.S.C. §119(e) of U.S. provisional patent application Ser. No. 60/743,894 filed March 29, 2006, now expired, and U.S. provisional patent application Ser. No. 60/804,660 filed June 14, 2006, now expired, both of which are incorporated by reference herein.

Please amend the paragraph in the specification beginning at page 7, line 2 as follows:

As to the processor's reaction to the object identification, it can be programmed to assign a classification of "no threat" or "hostile" based on the object identification. The library of stored silhouettes preferably includes silhouettes of large and small animals and large and small humans in which case, the processor can be programmed to assign the hostile classification to large animals and humans and the no threat classification to small animals and humans. Other possible differentiations of classifications may be based on size. When a hostile classification is generated, the processor also preferably activates countermeasures based on the object identification. For example, the processor can command the alarm system to generate the audible and/or visual alarm in proximity to the structure and/or command a communication system to generate a ~~communications~~ communication about the condition of the structure and forward the communication to the remote destination, e.g., a police station, a fire station, a terminal monitored by an owner of the structure, or a private security station. The communication can include one or more images obtained by the camera(s) or one or more images derived from the images obtained by the camera(s).

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (Currently Amended) An alarm system for protecting a structure, comprising:

at least one motion detector arranged to have a field of view external of the structure and including an area proximate the structure;

at least one camera associated with and coupled to each of said at least one motion detector, each of said at least one camera being arranged relative to the associated one of said at least one motion detector such that said camera has a field of view encompassing at least part of the field of view of the associated one of said at least one motion detector, each of said at least one camera having a dormant state in which imaging by said camera is not performed and images are not obtained and an active state in which images are obtained and being automatically activated from the dormant state into the active state when the associated one of said at least one motion detector detects motion in its field of view such that said at least one camera obtains an image of the source of the motion detected by the associated one of said at least one motion detector; and

a processor coupled to said at least one camera and arranged to receive the image obtained by said at least one camera, derive a silhouette of any objects in the image, compare the silhouettes to a library of stored silhouettes having associated object identification to determine an exact or closest match of the derived silhouette to one of the stored silhouettes and retrieve the object identification associated with the exact or closest match, said processor being arranged to react to the detection of motion by said at least one motion detector based on the object identification.

2. (Original) The system of claim 1, wherein said at least one motion detector comprises a plurality of motion detectors, said at least one camera associated with said at least one motion detector being arranged to have a field of view overlapping a field of view of a plurality of said motion detectors.

3. (Original) The system of claim 1, wherein said at least one motion detector comprises a plurality of motion detectors and said at least one camera comprises a plurality of cameras.

4. (Original) The system of claim 3, wherein at least one of said cameras is associated with at least two of said motion detectors and arranged to have a field of view which also overlaps a field

of view of said at least two motion detectors such that said at least one camera is activated into its active state when any of said at least two motion detectors detects motion.

5. (Currently Amended) The system of claim 3, wherein at least one of said cameras is associated exclusively with each of said motion detectors, at least two of said cameras are associated exclusively with each of said motion detectors or at least two of said cameras are associated non-exclusively with each of said motion detectors, and

wherein when at least two of said cameras are associated with one of said motion detectors, each of said at least two cameras has a dormant state in which imaging by said camera is not performed and images are not obtained and an active state in which images are obtained, said at least two cameras all being activated from the dormant state into the active state when the associated one of said motion detectors detects motion in its field of view such that said at least two cameras obtain images of the source of the motion detected by the associated one of said motion detectors, and

said processor being arranged to analyze images from said at least two cameras ~~are analyzed by said processor~~ to determine depth information about ~~an~~ a common object appearing in the images from said at least two cameras which may be the source of the motion, the depth information being used in the object identification being performed by said processor and indicating a distance between the structure and the object, said processor being arranged to react to the detection of motion by said at least one motion detector based on the object identification and based on the distance between the structure and the object.

6. (Original) The system of claim 1, wherein said processor is arranged to assign a classification of "no threat" or "hostile" based on the object identification and/or the size of the object, the library of stored silhouettes including silhouettes of large and small animals and large and small humans and said processor is programmed to assign the hostile classification to large animals and humans and the no threat classification to small animals and humans.

7. (Currently Amended) The system of claim 6, wherein only when said processor assigns a hostile classification and not when said processor assigns a no threat classification, said processor is further arranged to activate countermeasures based on the object identification.

8. (Currently Amended) The system of claim 6, further comprising an audible and/or visual alarm system adapted to be arranged in connection with or surrounding the structure, said processor being coupled to said alarm system and only when said processor assigns a hostile classification and not when said processor assigns a no threat classification, said processor further is arranged to command said alarm system to generate the audible and/or visual alarm.

9. (Currently Amended) The system of claim 6, further comprising a communications system for generating communications and forwarding the communications to a remote destination, said processor being coupled to said communications system and only when said processor assigns a hostile classification and not when said processor assigns a no threat classification, said processor further is arranged to command said communications system to generate a ~~communications~~ communication about the condition of the structure and forward the communication to the remote destination.

10. (Original) The system of claim 9, wherein the remote destination is a police station, a fire station, a terminal monitored by an owner of the structure, or a private security station.

11. (Currently Amended) The system of claim 9, wherein said processor provides said ~~communication~~ communications system with one or more images obtained from said at least one camera or one or more images derived from the images obtained from said at least one camera and said ~~communication~~ communications system ~~being~~ is arranged to include the one or more images into the communications being forwarded to the remote destination.

12. (Original) The system of claim 1, further comprising:

a telecommunications module coupled to said at least one motion detector, said telecommunications module being capable of communications over a telecommunications network; and

a handheld telecommunications unit for transmitting commands to said telecommunications module to activate and deactivate said at least one motion detector.

13. (Currently Amended) A method for protecting a structure, comprising:

arranging a plurality of motion detectors on or around the structure, each in a position in which its field of view includes an area proximate the structure;

arranging a plurality of cameras on or around the structure, each camera being associated with one or more of the motion ~~detector~~ detectors such that the camera has a field of view encompassing at least part of the field of view of any associated motion detector, each of the cameras having a dormant state in which imaging by said camera is not performed and images are not obtained and an active state in which images are obtained and being automatically activated from the dormant state into the active state when an associated motion detector detects motion in its field of view such that the camera then obtains an image of the source of the motion detected by the associated motion detector;

providing a processor which receives images obtained by the cameras, derives a silhouette of any objects in the image, compares the silhouettes to a library of stored silhouettes having associated object identification to determine an exact or closest match of the derived silhouette to one of the stored silhouettes and retrieves the object identification associated with the exact or closest match; and

generating a countermeasure to the detection of motion by the motion detectors based on the object identification when the object is identified as a potential threat to the structure.

14. (Currently Amended) The method of claim 13, wherein each camera is associated with only a single motion detector, each camera is associated with a plurality of motion detectors or multiple cameras are associated with each motion detector, wherein when a plurality of cameras are associated with one of the motion detectors, each of the cameras has a dormant state in which images are not obtained and an active state in which images are obtained and both cameras are activated into the active state when the associated one of the motion detectors detects motion in its field of view such that the plurality of cameras obtain images of the source of the motion detected by the associated one of the motion detectors, and further images from the plurality of cameras are analyzed by the processor to determine depth information about ~~an~~ a common object appearing in the images which may be the source of the motion, the depth information being used in the object identification being performed by the processor and indicating a distance between the structure and the object, the processor being arranged to react to the detection of motion by the at least one motion detector based on the object identification and based on the distance between the structure and the object.

15. (Currently Amended) The method of claim 13, further comprising assigning a classification of "no threat" or "hostile" based on the object identification and/or the size of the object, the countermeasure being generated only when the classification is hostile and not when the classification is no threat.

16. (Original) The method of claim 13, wherein the step of generating countermeasures includes generate an audible and/or visual alarm in proximity to the structure or generating at least one communication about the condition of the structure based on the object identification and forwarding the communication to the remote destination.

17. (Original) The method of claim 16, wherein the remote destination is a police station, a fire station, a terminal monitored by an owner of the structure, or a private security station.

18. (Original) The method of claim 16, further comprising including one or more images obtained from the cameras or one or more images derived from the images obtained from the cameras in the communication being forwarded to the remote destination.

19. (Original) The method of claim 13, further comprising;

integrating a telecommunications module in connection with the processor, the telecommunications module being capable of communications over a telecommunications network; and

programming the telecommunications module to receive commands from a handheld telecommunications unit over the telecommunications network to enable activation and deactivation of the motion detectors and cameras using the telecommunications unit.

20-22. (Canceled)

23. (New) The system of claim 6, further comprising a communications system for generating communications and forwarding the communications to a remote destination, said processor being coupled to said communications system and only when said processor assigns a hostile classification and not a no threat classification, said processor further is arranged to command said communications system to generate a communication including a message or warning specific to the identified object as determined by said processor and forward the communication to the remote destination, the message or warning being selected from a plurality of predetermined messages or warnings provided for different possible objects.

24. (New) The system of claim 6, further comprising a communications system for generating communications and forwarding the communications to a remote destination, said processor being coupled to said communications system and only when said processor assigns a hostile classification and not a no threat classification, said processor further is arranged to command said communications system to generate a communication including one or more of the images from which the object was identified and forward the communication to the remote destination.

25. (New) The system of claim 9, wherein said at least one motion detector comprises a plurality of motion detectors and said at least one camera comprises a plurality of first cameras, said first cameras being oriented in a general direction away from the structure to obtain images of areas outside of the structure, the system further comprising a second camera arranged to obtain images of the structure itself, said processor being arranged to provide said communications system with images obtained from at least one of said first cameras and images obtained from said second camera, or derivations thereof, and said communications system is arranged to include the images or derivations thereof in the communications being forwarded to the remote destination.

REMARKS/ARGUMENTS

Entry of this amendment and reconsideration of the present application, as amended, are respectfully requested.

Claims 1-19 and new claims 23-25 are pending in this application, claims 20-22 having been canceled.

Claims 1, 5, 7-9, 11 and 13-15 are amended herein. Unless an argument is made below in support of the patentability of each of these claims over a cited prior art reference in view of an amendment to the claim, the amendments to the claims do not relate to patentability.

Specification

The specification has been amended to provide updated status of applications mentioned therein. No new matter is introduced by the changes to the specification.

Claim Rejections-35 U.S.C. §103

Claims 1-22 were rejected under 35 U.S.C. §103(a) as being unpatentable over Shiota (U.S. Pat. Appln. Publ. No. 2003/0202102) in view of Wootton et al. (WO 98/28706). Claims 20-22 have been canceled and therefore the rejection of these claims has been rendered moot.

With respect to claims 1-19, independent claims 1 and 13 are amended to clarify a critical difference between the invention and the cited prior art. Specifically, claims 1 and 13 now recite that in the dormant state of the camera, imaging by the camera is not performed and images are not obtained, whereas in contrast, in the active state, images are obtained. As described in the specification at page 13, line 16 to page 14, line 6, the cameras are triggered, by motion detected by motion detectors, to obtain images. An advantage of the invention is therefore obtained wherein the cameras do not continually operate and obtain images (the dormant state), but rather are only activated and obtain images (the active state) when motion is detected, thereby conserving electricity or battery power and lengthening the operation of the cameras when running on battery power (see page 15, lines 1-5).

The cited prior art does not disclose providing cameras with a dormant state in which they do not obtain images and activating them into an active state based on detected motion.

Shiota et al. discloses a monitoring system wherein images are obtained by a plurality of cameras and continuously displayed on a common screen (see Fig. 4). When motion is detected in the field of view of one camera, one or more of the other cameras are adjusted to change their field of view to that in which motion was detected.

In contrast to the present claimed invention, in Shiota, all of the cameras are always obtaining images and thus none of them have a dormant state in which they are not performing imaging and obtaining images. The lack of movement of the cameras is not equivalent to a dormant state as in the claimed invention because even though not moving, the cameras are still operating and obtaining images.

Wootton et al. does not disclose providing a camera with a dormant state in which imaging is not performed and activating the camera from the dormant state to an active state based on detected motion.

Therefore, one of ordinary skill in the art could not have combined Shiota et al. and Wootton et al. and arrived at the embodiments of the present invention set forth in amended independent claims 1 and 13 or the embodiments set forth in claims 2-12 and 14-19 which depend therefrom.

Moreover, the cited prior art does not disclose, teach or suggest features of the dependent claims. For example, Shiota et al. and Wootton et al. do not disclose a processor that analyzes images from multiple cameras to determine depth information about a common object appearing in the images which may be the source of the motion, indicating a distance between the structure and the object, and using the depth information in the object identification being performed by the processor so that the processor reacts to the detection of motion based on the object identification and based on the distance between the structure and the object, as set forth in claims 5 and 14. In these embodiments, both the identification of the object based on the silhouette analysis and the distance between the structure and object is considered when determining the existence of a threat and thus the reaction of the processor. This combination is not disclosed in Shiota et al. or Wootton et al.

With respect to claims 9-12, 14, 17-19, the applicant disputes the Examiner's "official notice" for each of these claims and requests the Examiner identify prior art which discloses each of the allegedly well known features set forth in these claims. For example, claims 12 and 19 are directed to the feature of remote control of a motion detector which is part of a security system. The availability of hardware and/or software at the time of the invention alone should not suffice to support the knowledge of the features of these claims but rather, the application of the hardware and/or software to perform the functions recited in these claim is believed to be necessary.

In view of the foregoing, it is respectfully submitted that the Examiner's rejection of claims 1-19 has been overcome and should be removed.

New Claims

Claims 23-25 are added and in view of the cancellation of claims 20-22, no fee is due for the presentation of these claims.

Claim 23 recites that a processor commands a communications system to generate a communication including "a message or warning specific to the identified object as determined by said processor" and forward the communication to the remote destination, the message or warning being selected from a plurality of predetermined messages or warnings provided for different possible objects. This feature is disclosed in the specification at, for example, page 19, lines 1-6.

Claim 24 recites that a processor commands a communications system to generate a communication including one or more of the images from which the object was identified and forward the communication to the remote destination. This feature is disclosed in the specification at, for example, page 19, lines 1-6.

Claim 25 recites that in addition to cameras associated with motion detectors, there is a camera which obtain images of the structure itself and a processor provides a communications system with images obtained from the motion-detector associated cameras and images of the structure itself, or derivations thereof, so that such images or derivations are included in communications being forwarded to a remote destination. This feature is disclosed in the specification at, for example, page 19, lines 7-9.

Claims 23-25 should be patentable over the cited prior art for the same reasons that claims 1-19 are patentable over the cited prior art and/or because the cited prior art does not disclose all of the features set forth in these claims.

An early and favorable action on the merits upon entry and consideration of this amendment is earnestly solicited.

FOR THE APPLICANT
Respectfully submitted,

/Brian Roffe/

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Electronic Acknowledgement Receipt	
EFS ID:	4366817
Application Number:	11692430
International Application Number:	
Confirmation Number:	7545
Title of Invention:	SECURITY ALARM SYSTEM
First Named Inventor/Applicant Name:	Mark Dronge
Customer Number:	22846
Filer:	Brian Roffe
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Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		081128_126-107_amendment.pdf	61707 951b8cee27b8935b642020a8d4d82c22ff2959a5	yes	11

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Amendment/Req. Reconsideration-After Non-Final Reject	1	1
	Specification	2	2
	Claims	3	8
	Amendment/Req. Reconsideration-After Non-Final Reject	9	11
Warnings:			
Information:			
	Total Files Size (in bytes):	61707	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/06 (07-06)
Approved for use through 1/31/2007. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number	Filing Date	☒ To be Mailed
11/692,430	03/28/2007	

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY ☒ RATE ($)	SMALL ENTITY ☒ FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =			X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT 11/28/2008	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 22	Minus	** 22	= 0	X $26 =	0	OR	X $ =	
Independent (37 CFR 1.16(h))	* 2	Minus	***3	= 0	X $110 =	0	OR	X $ =	
☐ Application Size Fee (37 CFR 1.16(s))									
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE	0	OR	TOTAL ADD'L FEE	

AMENDMENT	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)	OR	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =		OR	X $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =		OR	X $ =	
☐ Application Size Fee (37 CFR 1.16(s))									
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

Legal Instrument Examiner:
/KATRINA HARLING/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/692,430	03/28/2007	Mark Dronge	126.107	7545

22846 7590 08/28/2008

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EXAMINER	
BHATNAGAR, ANAND P	
ART UNIT	PAPER NUMBER
2624	

MAIL DATE	DELIVERY MODE
08/28/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	11/692,430	DRONGE, MARK	
	Examiner	Art Unit	
	ANAND BHATNAGAR	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 March 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *03/28/07* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shiota et al. (U.S. patent pub. 2002/0202102 A1 will be further referred to as Shiota), and further in view of Wootton et al. (WO 98/28706).

Regarding claim 1: Shiota discloses an alarm system for protecting a structure (Shiota fig. 1 elements S1-S6, 4A-4D, and 6 and paragraphs 0001, 0009-0013, and 0053, wherein areas are monitored, i.e. protected, for an abnormality, such as a moving object in the area). comprising:

at least one motion detector arranged to have a field of view external of the structure and including an area proximate the structure (Shiota; fig. 5 elements S5 and S6, wherein these sensors, i.e. read as motion detectors since they detect moving objects, are outside the area. This is read as a motion detector having a view outside the structure.);

at least one camera associated with each of said at least one motion detector, each of said at least one camera being arranged relative to the associated one of said at least one motion detector such that said camera has a field of view encompassing at least part of the field of view of the associated one of said at least one motion detector, said at least one camera having a dormant

state in which images are not obtained and an active state in which images are obtained and being activated into the active state when the associated one of said at least one motion detector detects motion such that said at least one camera obtains an image of the source of the motion detected by the associated one of said at least one motion detector (Shiota; fig. 1 elements 4A-4D and S1-S6, and paragraphs 0009-0013 and 0047-0055, wherein multiple cameras and sensors monitor an area with overlapping views. Each of these cameras can be controlled simultaneously or individually. When only one camera is controlled means the other camera(s) are not obtaining images, i.e. read as inactive/dormant and vice versa. Further depending on the sensor that is activated, based on a detected abnormality, a specific camera is activated and obtaining images while the other cameras are not.); and

a processor coupled to said at least one camera and arranged to receive the image obtained by said at least one camera (fig. 1 element 6 and fig. 2 element 6).

Shiota does not teach the feature of "derive a silhouette of any objects in the image, compare the silhouettes to a library of stored silhouettes having associated object identification to determine an exact or closest match of the derived silhouette to one of the stored silhouettes and retrieve the object identification associated with the exact or closest match, said processor being arranged to react to the detection of motion by said at least one motion detector based on the object identification." Wootton et al. teaches to "derive a silhouette

of any objects in the image, compare the silhouettes to a library of stored silhouettes having associated object identification to determine an exact or closest match of the derived silhouette to one of the stored silhouettes and retrieve the object identification associated with the exact or closest match, said processor being arranged to react to the detection of motion by said at least one motion detector based on the object identification" (Wootton et al.; abstract, fig. 1 elements 10-14, and page 6 lines, 3-28). It would have been obvious to one ordinary skilled in the art to combine the teaching of Wootton et al. to that of Shiota because they are analogous in the art of surveillance. One ordinary skilled in the art would have been motivated to combine the teaching Wootton et al. to that of Shiota in order to limit the number of false alarms.

Regarding claim 2: The system wherein said at least one motion detector comprises a plurality of motion detectors (Shiota; fig. 1 elements S1-S6), said at least one camera associated with said at least one motion detector being arranged to have a field of view overlapping a field of view of a plurality of said motion detectors (Shiota; fig. 1 elements 4A-4D, wherein the camera views are overlapping).

Regarding claim 3: The system wherein said at least one motion detector comprises a plurality of motion detectors (Shiota; fig. 1 elements S1-S6) and said at least one camera comprises a plurality of cameras (Shiota; fig. 1 elements 4A-4D).

Regarding claim 4: Neither Shiota nor Wootton et al. teaches the feature of "wherein at least one of said cameras is associated with at least two of said motion detectors and arranged to have a field of view which also overlaps a field of view of said at least two motion detectors such that said at least one camera is activated into its active state when any of said at least two motion detectors detects motion." This is a matter of design choice of which sensors to activate with the specific number of cameras and vice versa. It would have been obvious to one ordinary skilled in the art of to modify the system to use one camera with two sensors based on the availability of the hardware and/or software at the time of this instant invention.

Regarding claim 5: Neither Shiota nor Wootton et al. teaches the feature of "wherein at least one of said cameras is associated exclusively with each of said motion detectors, at least two of said cameras are associated exclusively with each of said motion detectors or at least two of said cameras are associated non-exclusively with each of said motion detectors, wherein when at least two of said cameras are associated with one of said motion detectors, images from said at least two cameras are analyzed by said processor to determine depth information about an object appearing in the images, the depth information being used in the object identification being performed by said processor." This is a matter of design choice of which sensors to activate with the specific number of cameras and vice versa. It would have been obvious to one ordinary skilled in the

art of to modify the system based on the availability of the hardware and/or software at the time of this instant invention.

Regarding claim 6: Wooton teaches “wherein said processor is arranged to assign a classification of "no threat" or "hostile" based on the object identification and/or the size of the object, the library of stored silhouettes including silhouettes of large and small animals and large and small humans and said processor is programmed to assign the hostile classification to large animals and humans and the no threat classification to small animals and humans (fig. 1 elements 10-14, wherein the object is classified as human or nonhuman and an alarm is sent based on this classification. If the alarm is triggered means that a threat is present” and vice versa. It is a matter of design choice to classify specific

Regarding claim 7: The system wherein when said processor assigns a hostile classification, said processor is further arranged to activate countermeasures based on the object identification. See claim 6 wherein an alarm is activated, i.e. a countermeasure.

Regarding claim 8: The system further comprising an audible and/or visual alarm system adapted to be arranged in connection with or surrounding the structure, said processor being coupled to said alarm system and when said processor assigns a hostile classification, said processor further is arranged to command said alarm system to generate the audible and/or visual alarm. See claims 6 and 7.

Regarding claim 9: Neither Shiota nor Wootton et al. teaches the feature of ”a communications system for generating communications and forwarding the communications to a remote destination, said processor being coupled to said communications system and when said processor assigns a hostile classification, said processor further is arranged to command said communications system to generate a communications about the condition of the structure and forward the communication to the remote destination. This is a well known feature in the art of image processing. Examiner takes OFFICIAL NOTICE. It would have been obvious to one ordinary skilled in the art to incorporate this well known feature. One ordinary skilled in the art would have been motivated to incorporate this feature based on the availability of the hardware and/or software available at the time of invention.

Regarding claim 10: Neither Shiota nor Wootton et al. teaches the feature “wherein the remote destination is a police station, a fire station, a terminal monitored by an owner of the structure, or a private security station.” Examiner takes OFFICIAL NOTICE. It would have been obvious to one ordinary skilled in the art to incorporate this well known feature. One ordinary skilled in the art would have been motivated to incorporate this feature based on the availability of the hardware and/or software available at the time of invention.

Regarding claim 11: Neither Shiota nor Wootton et al. teaches the feature of “wherein said processor provides said communication system with one or more images obtained from said at least one camera or one or more images

derived from the images obtained from said at least camera and said communication system being arranged to include the one or more images into the communications being forwarded to the remote destination." Examiner takes OFFICIAL NOTICE. It would have been obvious to one ordinary skilled in the art to incorporate this well known feature. One ordinary skilled in the art would have been motivated to incorporate this feature based on the availability of the hardware and/or software available at the time of invention.

Regarding claim 12: Neither Shiota nor Wootton et al. teaches the feature of "a telecommunications module coupled to said at least one motion detector, said telecommunications module being capable of communications over a telecommunications network; and a handheld telecommunications unit for transmitting commands to said telecommunications module to activate and deactivate said at least one motion detector." Examiner takes OFFICIAL NOTICE. It would have been obvious to one ordinary skilled in the art to incorporate this well known feature. One ordinary skilled in the art would have been motivated to incorporate this feature based on the availability of the hardware and/or software available at the time of invention.

Regarding claim 13: See claim 1.

Regarding claim 14: Neither Shiota nor Wootton et al. teaches the feature of "wherein each camera is associated with only a single motion detector, each camera is associated with a plurality of motion detectors or multiple cameras are associated with each motion detector, wherein when a plurality of cameras are

associated with one of the motion detectors, images from the plurality of cameras are analyzed by the processor to determine depth information about an object appearing in the images, the depth information being used in the object identification being performed by the processor." Examiner takes OFFICIAL NOTICE. It would have been obvious to one ordinary skilled in the art to incorporate this well known feature. One ordinary skilled in the art would have been motivated to incorporate this feature based on the availability of the hardware and/or software available at the time of invention.

Regarding claim 15: See claim 6.

Regarding claim 16: See claim 6-8.

Regarding claim 17: See claim 10.

Regarding claim 18: See claim 11.

Regarding claim 19: See claim 12.

Regarding claim 20: See claim 1 and 13.

Regarding claim 21: See claim 6.

Regarding claim 22: See claim 10 and 11.

Conclusion

2. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Pomerleau (U.S. patent 5,091,780) wherein alarm is triggered at a specific location such as a guard station, police station, etc.

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANAND BHATNAGAR whose telephone number is (571)272-7416. The examiner can normally be reached on M-Th 7:30am-4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on 571-272-7453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Anand Bhatnagar/
Temporary Full Signatory
August 27, 2008

Notice of References Cited	Application/Control No. 11/692,430	Applicant(s)/Patent Under Reexamination DRONGE, MARK	
	Examiner ANAND BHATNAGAR	Art Unit 2624	Page 1 of 1

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*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-5,091,780	02-1992	Pomerleau, Dean A.	348/152
*	B	US-6,985,172	01-2006	Rigney et al.	348/149
*	C	US-6,069,655	05-2000	Seeley et al.	348/154
*	D	US-6,782,847	08-2004	Shemesh et al.	119/718
*	E	US-2003/0202102	10-2003	Shiota et al.	348/159
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N	WO 98/28706	07-1998	US	Wootton et al.	G06K 9/20
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11692430	DRONGE, MARK
	Examiner	Art Unit
	ANAND BHATNAGAR	2624

SEARCHED			
Class	Subclass	Date	Examiner
382	100,103,106,107,159,170,181,190,195,203,206	08/27/08	/AB/
348	142,143,152,155,159,169	08/27/08	/AB/
Text	see sheet	08/27/08	/AB/

SEARCH NOTES		
Search Notes	Date	Examiner
East	08/27/08	/AB/
Inventor	08/27/08	/AB/

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner

	/ANAND BHATNAGAR/ Primary Examiner.Art Unit 2624

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CONFIRMATION NO. 7545

SERIAL NUMBER	FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
11/692,430	03/28/2007 RULE	382	2624	126.107

APPLICANTS
Mark Dronge, Tenafly, NJ;

**** CONTINUING DATA ***************************
This appln claims benefit of 60/743,894 03/29/2006
and claims benefit of 60/804,660 06/14/2006

**** FOREIGN APPLICATIONS ***************************

**** IF REQUIRED, FOREIGN FILING LICENSE GRANTED **** ** SMALL ENTITY **
04/05/2007

Foreign Priority claimed	☐ Yes ☑ No	☐ Met after Allowance	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
35 USC 119(a-d) conditions met	☐ Yes ☑ No		NJ	4	22	3
Verified and Acknowledged	/ANAND P BHATNAGAR/ Examiner's Signature	Initials				

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VALLEY STREAM, NY 11580-6111
UNITED STATES

TITLE
SECURITY ALARM SYSTEM

FILING FEE RECEIVED		
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	11692430
Filing Date	2007-03-28
First Named Inventor	Mark Dronge
Art Unit	2624
Examiner Name	
Attorney Docket Number	126.107

U.S.PATENTS

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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	2	5283551		1994-02-01	Guscott	
	3	5473311		1995-12-05	Hoseit	
	4	5576972		1996-11-19	Harrison	
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	11692430
	Filing Date	2007-03-28
	First Named Inventor	Mark Dronge
	Art Unit	2624
	Examiner Name	
	Attorney Docket Number	126.107

	9	6542671		2003-04-08	Ito et al.	
	10	6782847		2004-08-31	Shemesh et al.	
	11	6864789		2005-03-08	Wolfe	

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U.S.PATENT APPLICATION PUBLICATIONS

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20040215750		2004-10-28	Stilp	
	2	20040233287		2004-11-25	Schnell	
	3	20050011466		2005-01-20	Doyle II	
	4	20050151851		2005-07-14	Schnell	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	11692430
	Filing Date	2007-03-28
	First Named Inventor	Mark Dronge
	Art Unit	2624
	Examiner Name	
	Attorney Docket Number	126.107

	1	JP1140396			1989-06-01	Takuji et al.		☐
	2	JP5064198			1993-03-12	Atsushi et al.		☐
	3	JP5328355			1993-12-10	Takaiwa et al.		☐
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	5	WO9828706			1998-07-02	Wootton et al.		☐
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	7	JP2004077350			2004-03-11	Nobuyasu		☐

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Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T5
	1	"TAC I/NET Seven Security", TAC, Jan. 2006	☐

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EAST Search History

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L21	0	"199828706"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/08/27 10:21
L22	0	"wo9828706"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/08/27 10:21
L23	471	wootton.in.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/08/27 10:21
S1	14479	382/100,103,106,107,159,170,181,190, 195,203,206;348/142,143,152,155,159, 169.ccls.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/07/11 11:43
S2	1208	S1 and ((camera$1 video CCD CMOS) same (motion$4 near6 (detect$4 sensor$1)))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/07/11 11:44
S3	270	S2 and ((identif$6 verif$5 classif$7) with (animal$1 dog$1 cat$1 bear$1 human$1 person$1))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/07/11 11:46
S4	209	S3 and (secur$4 surveillan$5)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/07/11 11:47
S5	34	S2 and ((identif$6 verif$5 classif$7) with (animal$1 dog$1 cat$1 bear$1))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/07/11 11:59

EAST Search History

S6	3270	S1 and ((camera$1 video CCD CMOS) same ((motion$4 near4 (detect$4 sensor$1)) track$4))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/07/11 12:36
S7	97960	((camera$1 video CCD CMOS) same ((motion$4 near4 (detect$4 sensor$1)) track$4))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/07/11 12:36
S8	1157	S7 and((identif$6 verif$5 classif$7) with (animal$1 dog$1 cat$1 bear$1 racoon$1))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/07/11 12:37
S9	643	S8 and (secur$4 surveillan$5)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/07/11 12:40
S10	19	S9 and ("no" near5 (alarm$4 warn$4))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/07/11 12:40
S11	2	"20030202102".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/07/11 13:08
S12	0	"4679077.pn.,5283551.pn.,5473311.pn., 5576972.pn.,5748775.pn.,5864640.pn., 5963148.pn.,6532901.pn.,6782847.pn. 6864789.pn.,20040215750.pn., 20040233287.pn.,20050011466.pn., 20050151851.pn.",	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/07/11 13:27
S13	28	"4679077".pn.",5283551".pn.",5473311". pn.",5576972".pn.",5748775".pn.", 5864640".pn.",5963148".pn.",6532901".pn. ",6782847".pn."6864789".pn.", 20040215750".pn.",20040233287".pn.", 20050011466".pn.",20050151851".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/07/11 13:28

EAST Search History

S14	2	"5328355".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/07/11 13:36
S15	3	"2005328355".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/07/11 13:37
S16	4	"9828706"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/07/11 13:38
S17	12	"5328355"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/07/11 13:39
S18	319960	Ito.in.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/07/11 13:47
S19	0	S18 and "20030408".rlpd.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/07/11 13:52
S20	0	S18 and "20030408".RLPD.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/07/11 13:53
S21	65	"20030408".RLPD.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/07/11 13:54

EAST Search History

S22	65	"20030408".RLPD.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/07/11 13:55
S23	22698	"20030408"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/07/11 13:56
S24	172	S23 and ito.in.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/07/11 13:56
S25	65	"20030408".RLPD.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/07/11 13:58
S26	14692	382/100,103,106,107,159,170,181,190, 195,203,206;348/142,143,152,155,159, 169.ccls.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/08/25 13:33
S27	703	S26 and (securit$4 surveill$6 observa$7) and (camera$1 same (motion$4 near6 (detect$6 sensor$1 device$1)))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/08/25 13:34
S28	248	S27 and (camera$1 same ((active on record$4) and (inactiv$3 off ("not" with record$3))))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/08/25 13:36
S29	629	((detect$4 determin$5) with (animal$1 dog$1 cat$1 threat$4 danger$5)) and (securit$4 surveill$6 observa$7) and (camera$1 same (motion$4 near6 (detect$6 sensor$1 device$1)))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/08/25 13:59

EAST Search History

S30	135	S29 and (camera$1 same ((active on) and (inactiv$3 off)))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/08/25 14:00
S31	126	((identif$6 authenticat$4 verif$6) near5 (animal$1 dog$1 cat$1 threat$4 danger$5)) and (securit$4 surveill$6 observa$7) and (camera$1 same (motion$4 near6 (detect$6 sensor$1 device$1)))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/08/25 14:12
S32	92	S31 not S30	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/08/25 14:12
S33	242	"4679077" "5283551" "5473311" "5576972" "5748775" "5864640" "5963148" "65329016782847" "6864789"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/08/26 14:40
S34	252	"4679077" "5283551" "5473311" "5576972" "5748775" "5864640" "5963148" "65329016782847" "6864789" "20040215750" "20040233287" "20050011466" "20050151851"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/08/26 14:40
S35	28	"4679077".pn.",5283551".pn.",5473311". pn.",5576972".pn.",5748775".pn.", 5864640".pn.",5963148".pn.",6532901".pn. ",6782847".pn.",6864789".pn.", 20040215750".pn.",20040233287".pn.", 20050011466".pn.",20050151851".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/08/26 14:43
S36	932	takaiwa.in.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/08/26 14:48
S37	0	S36 and "5328355"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/08/26 14:48

EAST Search History

S38	1	S36 and "05328355"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/08/26 14:49

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11692430	DRONGE, MARK
	Examiner	Art Unit
	ANAND BHATNAGAR	2624

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	08/27/2008								
	1	✓								
	2	✓								
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	4	✓								
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	21	✓								
	22	✓								

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(74) Agent: MULLER, J., Joseph; Polster, Lieder, Woodruff & Lucchesi, 763 South New Ballas Road, St. Louis, MO 63141 (US).

(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, GW, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).

Published

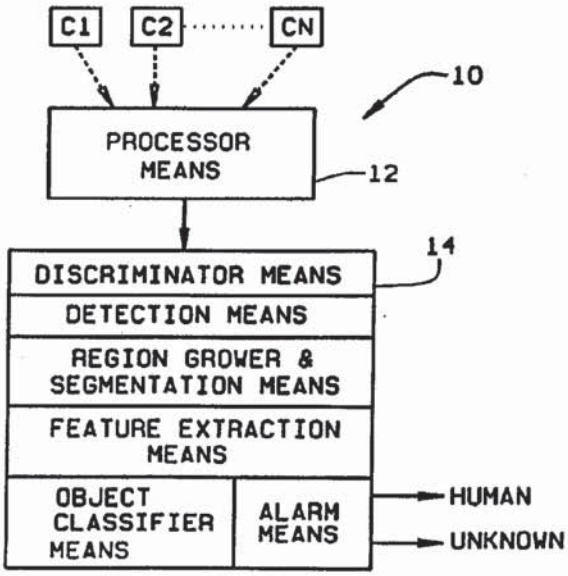
With international search report.

Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.

(54) Title: LOW FALSE ALARM RATE VIDEO SECURITY SYSTEM USING OBJECT CLASSIFICATION

(57) Abstract

A video detection system (10) and method detects an intruder from video images of a scene. The method employs a recognition process to differentiate between humans and animals. The method is used only after possible false alarms resulting from identified effects of noise, aliasing, non-intruder motion occuring within the scene, and effects of global or local lighting changes. The object recognition process includes determining the regions containing a potential intruder, outlining and growing those regions to encompass all of potential intruders, determining a set of shape features from the region and eliminating possible shadow effects, normalizing the set, and comparing the normalized set with sets of features of humans and animals. This comparison produces a confidence level indicating a human intruder. An alarm is given for a sufficiently high confidence level. The possibility of a false alarm due to an animal or a non-identifiable object is also substantially eliminated.



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LOW FALSE ALARM RATE VIDEO SECURITY SYSTEM USING OBJECT CLASSIFICATION

Technical Field

This invention relates to video security systems and a method for detecting the presence of an intruder into an area being monitored by the system; and more particularly, to i) the rejection of false alarms which might otherwise occur because of global or local, natural or manmade, lighting changes which occur within a scene observed by the system, ii) the discernment of an intruder based upon sensed surface differences which occur within the scene rather than lighting changes which may occur therewithin, and iii) the classification of an intruder detected by the system as either human or non-human, and to provide an alarm if the intruder is classified as a human.

Background Art

A security system of the invention uses a video camera as the principal sensor and processes a resulting image to determine the presence or non-presence of an intruder. The fundamental process is to establish a reference scene known, or assumed, to have no intruder(s) present. An image of the present scene, as provided by the video camera, is compared with an image of the reference scene and any differences between the two scenes are ascertained. If the contents of the two scenes are markedly different, the interpretation is that an intrusion of some kind has occurred within the scene. Once the possibility of an intrusion is evident, the system and method operate to first eliminate possible sources of false alarms, and to then classify any remaining differences as being the result of a human or non-human intrusion. Only if a determination is made that the anomaly results from a human intrusion is a notification (alarm) made. All other anomalies which produce a difference between the two images are identified as false alarms for which no notification is given.

One issue addressed in making the determination is the possibility of false alarms caused by lighting changes within a scene, whether natural or

manmade, global or local. As discussed therein, the differences between the reference scene and a later scene resulting from lighting effects can be now be identified so that no false alarm results from them. However, there are other potential causes of false alarms which also must be recognized. The video security system and image processing methodology as described herein recognizes anomalies resulting from these other causes so these, too, can be accounted for. The method includes comparing, on a pixel by pixel basis, the current image with the reference image to obtain a difference image. Any non-zero pixel in the difference image indicates the possible presence of an intrusion, after image artifacts such as noise, aliasing of the video, and movement within the scene not attributable to a life form (animal or human) such as the hands of a clock, screen savers on computers, oscillating fans, etc., have been accounted for. Because the system and method use an absolute difference technique with pixel by pixel subtraction, the process is sensitive to surface differences between the scene but insensitive to light on dark or dark on light changes, and thus is very sensitive to any intrusion within the scene. Furthermore, each pixel represents a gray level measure of the scene intensity that is reflected from that part of the scene. The gray level intensity can alter for a variety of reasons, the most relevant of these being that there is a new physical presence at that particular part of the scene.

Two important features of the video security system is to inform an operator/verifier of the presence of a human intruder, and to not generate false alarms. Thus to be economically viable, and not place unduly high demands on the operator/verifier, the system must operate to eliminate as many false alarms as possible without impacting the overall probability of detecting an intruder's presence. A fundamental cause of false alarms stems from the sensor and methodology used to ascertain if an intrusion has occurred. By use of the processing methodology described herein, various effects which could otherwise trigger false alarms are accounted for so that only a life form intruding into the scene will produce an alarm. However, even though

unwanted detections due to non animal/non-human caused motion are eliminated, it is still necessary to differentiate between a class of human motion and a class of non-human or animal motion. Only by doing so can intrusions resulting from human actions properly cause an alarm to be given and false alarms resulting from animal movements not be provided.

Previous attempts have made to provide a reliable security system. These systems have relied upon contact break mechanisms or PID (passive infra red) motion sensors to detect intruder presence. Examples of the use of infrared devices, either as a passive element or as a scanning device, are disclosed in U. S. patents 5,283,551, 5,101,194, 4,967,183, 4,952,911, 4,949,074, 4,939,359, 4,903,990, 4,847,485, 4,364,030, and 4,342,987. More recently, however, the realization that an image processor is required to transmit the video for confirmation purposes has led to the development of using the image processor to actually detect the possible presence of an intruder. Such a system has an economy of hardware and obviates the need for PID sensors or contact breaker devices. A security system of this type has comparable performance to a PID counterpart. However, there are areas where considerable benefits accrue if false alarms, which occur due to the erroneous injection of light into the scene without the presence of an intruder, are reduced or eliminated.

The cause of these false alarms stem from the sensor and methodology used to ascertain if an intrusion has occurred. As stated earlier, a past image of the scene being surveyed is compared with the present scene as taken from the camera. The form of comparison is essentially a subtraction of the two scenes on a pixel by pixel basis. Each pixel represents a gray level measure of the scene intensity that is reflected from that part of the scene. Gray level intensity can change for a variety of reasons, the most important being a new physical presence within a particular part of the scene. Additionally, the intensity will change at that location if the overall lighting of the total scene changes (a global change), or the lighting at this particular part of the scene changes (a local change), or the AGC (automatic gain control) of the camera changes, or the

ALC (automatic light level) of the camera changes. With respect to global or local lighting changes, these can result from natural lighting changes or manmade lighting changes. Finally, there will be a difference of gray level intensity at a pixel level if there is noise present in the video. Only the situation of a physical presence in the scene is a true alarm; the remainder all comprise false alarms within the system. For a security system to be economically viable and avoid an unduly high load on an operator who has to verify each alarm, the system must process images in a manner which eliminates as many of false alarms as possible without impacting the overall probability of detecting the presence of an intruder.

Some efforts have previously been made in attempting to recognize objects, including humans, whose presence is detected or sensed in an image. For example, U.S. patent 5,305,390 to Frey et al., teaches automatic recognition and classification of persons or objects as they pass through a doorway or entrance. The intrinsic sensor is an active laser beam, and the system of Frey et al. operates by measuring the height of an object passing through an aperture (doorway) to classify the object as a person or not. Therefore, the system is a height discriminator rather than an object recognition or classification system. Thus, for example, if a person crawls through the aperture, they will probably be designated as a non-human.

U.S. patent 5,289,275 to Ishii et al., is directed to a surveillance monitoring system using image processing for monitoring fires and thefts. The patent teaches use of a color camera for monitoring fires and a method of comparing the color ratio at each pixel in an image to estimate the radiant energy represented by each pixel. A resulting ratio is compared to a threshold with the presence of a fire being indicated if the threshold is surpassed. A similar technique for detecting the presence of humans is also described. The patent teaches the use of image processing together with a camera to detect the presence of fires and abnormal objects.

U.S. patent 4,697,097 to Yausa et al. also teaches use of a camera to

detect the presence of an object. Once an anomaly is detected because of differences in the comparison of an original and a later image, the system automatically dials and sends a difference image, provided the differences are large enough, to a remote site over a telephone line. At the remote site, the image is viewed by a human. While teaching some aspects of detection, Yausa et al. does not go beyond the detection process to attempt and use image processing to recognize that the anomaly is caused by a human presence.

U.S. patent 4,257,063, which is directed to a video monitoring system and method, teaches that a video line from a camera can be compared to the same video line viewed at an earlier time to detect the presence of a human. However, the detection device is not a whole image device, nor does it make any compensation for light changes, nor does it teach attempting to automatically recognize the contents of an image as being derived from a human. Similarly, U.S. patent 4,161,750 teaches that changes in the average value of a video line can be used to detect the presence of an anomalous object. Whereas the implementation is different from the '063 patent, the teaching is basically the same.

All of these previous attempts at recognition have certain drawbacks, whether the type of imaging, method of processing, etc., which would result in either an alarm not being provided when one should, or in false alarms being given. The system and method of the present invention overcome these problems or shortcomings to reliably provide accurate indications of human intrusion in an area being monitored by a security system. Such an approach is particularly cost efficient because it reduces the necessity of guards having to patrol secured areas (which means each area will be observed only on an infrequent basis unless there are a large number of guards), while ensuring that any intrusion in any area is not only observed, but an appropriate alarm is sounded in the event of a human intrusion.

Disclosure of the Invention

Among the several objects of the present invention may be noted the

provision of a video security system and method for visually monitoring a scene and detecting the presence of an intruder within the scene;

the provision of such a system and method whose operation is based upon the premise that only the presence of a human intruder is of consequence to the security system, with everything else constituting a false alarm;

the provision of such a system and method to readily distinguish between changes within the scene caused by the presence of a person entering the scene as opposed to changes within the scene resulting from lighting changes (whether global or local, natural or man made) and other anomalies which occur within the scene to detect the presence of an intruder;

the provision of such a system and method to employ a recognition process rather than an abnormality process such as used in other systems to differentiate between human and non-human objects, so to reduce or substantially eliminate false alarms;

the provision of such a system and method to provide a high probability of detection of the presence of a human, while having a low probability of false alarms;

the provision of such a system and method which provides image processing such that false alarms resulting from the inadvertent presence of artifacts as caused by noise, aliasing, non-intruder motion occurring within the scene, are identified and do not provoke a system response;

the provision of such a system and method which, once an intruder has been detected, further classifies the intrusion as resulting from the presence of a human life form, or the presence of non-human life forms, such as shadows, dogs, cats, rats, mice, birds, etc.

the provision of such a system and method in which an indication of an intrusion is given only after the cause of the intrusion has been determined as resulting from the presence of a human so to avoid giving false alarms;

the provision of such a system and method to also provide a second and lower level alarm in the event an object cannot be classified as human or non-

human so an operator/verifier is informed of the possible presence of an intruder in the scene;

the provision of such a system and method to evaluate a series of images of the scene and determine, for each image examined, the classification of an object so to have an increased confidence level that an object classified as a human is properly classified;

the provision of such a system and method in which the alarm indication which is provided includes automatically accessing a site remote from the scene where the intrusion occurs and transmitting an image of the scene in which the intruder is present to the remote site;

the provision of such a system and method in which the transmitted image is a compressed image of the scene rather than a small subset of the image; and,

the provision of such a system and method by which a number of areas can be continuously, reliably, and cost effectively monitored with a human intrusion in any area being reliably detected and the appropriate alarm given.

In accordance with the invention, generally stated, a video detection system detects the presence of an intruder in a scene from video provided by a camera observing the scene. A recognition process differentiates between human and non-human (animal) life forms. The presence of a human is determined with a high degree of confidence so there is a very low probability of false alarms. Possible false alarms resulting from the effects noise, aliasing, non-intruder motion occurring within the scene, and the effects of global or local lighting are first identified and only then is object recognition performed. Performing object recognition includes determining which regions within the image may be an intruder, outlining and growing those regions so the result encompasses all of what may be the intruder, determining a set of shape features from the region and eliminating possible shadow effects, normalizing the set of features and comparing the resulting set with sets of features for humans and non-human (animal) life forms. The result of the comparison produces a confidence

level as to whether or not the intruder is a human. If the confidence level is sufficiently high, an alarm is given. By performing object classification in this manner, the further possibility a false alarm may occur due to the presence of an animal, or a non-identifiable object in the scene is also substantiality eliminated. Other objects and features will be in part apparent and in part pointed out hereinafter.

Brief Description of Drawings

In the drawings, Fig. 1 is a simplified block diagram of a video security system of the present invention for viewing a scene and determining the presence of an intruder in the scene;

Fig. 2 is a representation of an actual scene viewed by a camera of the system;

Fig. 3 is the same scene as Fig. 2 but with the presence of an intruder;

Fig. 4 is a representation of another actual scene under one lighting condition;

Fig. 5 is a representation of the same scene under different lighting conditions and with no intruder in the scene;

Fig. 6A is a representation of the object in Fig. 3 including its shadow, Fig. 6B illustrates outlining and segmentation of the object; and Fig. 6C illustrates the object with its shadow removed and as resampled for determining a set of features for the object;

Figs. 7A-7C represent non-human (animal) life forms with which features of the object are compared to determine if the object represents a human or non-human life form and wherein Fig. 7A represents a cat, Fig. 7B a dog, and Fig. 7C a bird;

Figure 8 is a simplified time line indicating intervals at which images of the scene are viewed by the camera system;

Figure 9 represents a pixel array such as forms a portion of an image; and,

Fig. 10 illustrates masking of an image for those areas within a scene

where fixed objects having an associated movement or lighting change are located.

Corresponding reference characters indicate corresponding parts throughout the drawings.

Best Mode for Carrying Out the Invention

Referring to the drawings, a video security system of the invention is indicated generally 10 in Fig. 1. The system employs one or more cameras C1-Cn each of which continually views a respective scene and produces a signal representative of the scene. The cameras may operate in the visual or infrared portions of the light spectrum and a video output signal of each camera is supplied to a processor means 12. Means 12 processes each received signal from a camera to produce an image represented by the signal and compares the image representing the scene at one point in time with a similar image of the scene at a previous point in time. The signal from the imaging means represented by the cameras may be either an analog or digital signal, and processing means 12 may be an analog, digital, or hybrid processor.

In Fig. 2, an image of a scene is shown, the representation being the actual image produced by a camera C. Fig. 2 represents, for example, a reference image of the scene. Fig. 3 is an image exactly the same as that in Fig. 2 except that now a person (human intruder) has been introduced into the scene. Fig. 3 is again an actual image produced by a camera C. Similarly, Fig. 4 represents a reference image of a scene, and Fig. 5 a later image in which there is a lighting change but not an intrusion. The system and method of the invention operate to identify the presence of such a human intruder and provide an appropriate alarm. However, it is also a principal feature of the invention to not produce false alarms. As described herein and in the referenced co-pending application, there a numerous sources of false alarms and using a series of algorithms employed by the invention, these sources are identified for what they are so no false alarms are given.

Operation of the invention is such that segments of an image (Fig. 3, Fig.

5) which differ from segments of an earlier image (Fig. 2, Fig. 4) are identified. A discriminator means 14 evaluates those segments to determine if the differences are caused by a local lighting change within the scene (Fig. 5), or the movement of an intruder within the scene (Fig. 3). As noted, if the change is caused by an intruder, an alarm is given. But, if the differences result from global or local lighting changes, the effects of motion of objects established within the scene, noise, and aliasing effects, these are recognized as such so false alarm is not given. Detection of local lighting changes such as shown in Fig. 5 are described in the referenced co-pending application.

Generally, a single processor can handle several cameras positioned at different locations within a protected site. In use, the processor cycles through the different cameras, visiting each at a predetermined interval. At system power-up, the processor cycles through all of the cameras doing a self-test on each. One important test at this time is to record a reference frame against which later frames will be compared. A histogram of pixel values is formed from this reference frame. If the histogram is too narrow, a message is sent to the effect that this camera is obscured and will not used. This is done to guard against the possibility of someone obscuring the camera while it is off by physically blocking the lens with an object or by spray-painting it. If a camera is so obscured, then all the pixel values will be very nearly the same and this will show up in the histogram. Although the camera is now prevented from participating in the security system, the system operator is informed that something is amiss at that particular location so the problem can be investigated.

In accordance with the method, a reference frame f1 is created. Throughout the monitoring operation, this reference frame is continuously updated if there is no perceived motion within the latest image against which a reference image is compared. At each subsequent visit to the camera a new frame f2 is produced and subtracted from the reference. If the difference is not significant, the system goes on to the next camera. However, if there is a difference, frame f2 is stored and a third frame f3 is created on the next visit and

compared to both frames f1 and f2. Only if there is a significant difference between frames f3 and f2 and also frames f3 and f1, is further processing done. This three frame procedure eliminates false alarms resulting from sudden, global light changes such as caused by lightning flashes or interior lights going on or off. A lightning flash occurring during frame f2 will be gone by frame f3, so there will be no significant difference between frame f3 and f1. On the other hand, if the interior lights have simply gone on or off between frames f1 and f2, there will be no significant changes between frames f2 and f3. In either instance, the system proceeds on to the next camera with no more processing. Significant differences between frames f1 and f2, frames f3 and f2, and frames f3 and f1 indicate a possible intrusion requiring more processing.

Besides global lighting changes occurring between the images, non-intruder motion occurring within the scene is also identified so as not to trigger processing or cause false alarms. Thus, for example, if the fan shown in the lower left portion of Figs. 4 and 5 were running, movement of the fan blades would also appear as a change from one image to another. Similarly, if the fan is an oscillating fan, its sweeping movement would also be detected as a difference from one image to another. As described hereinafter, and as shown in Fig. 10, the area within the scene where an object having an associated movement is generally fixed and its movement is spatially constrained movement, the area where this movement occurs is identified and masked so, in most instances, motion effects resulting from operation of the object (fan) are disregarded. Although, if the motion of an intruder overlaps the masked area, the difference from one image to another is identified and further processing, including the normally masked area takes place. It will be understood that there are a variety of such sources of apparent motion which are identified and masked. Besides the fan, there are clocks both digital and those having hands. In one instance, the numerical display of time changes; in the other instance, the hands of the clock (particularly the second hand) has a noticeable movement. Computers with screen savers may have a constantly changing image on their monitors. In manufacturing areas,

different pieces of equipment, rotating or reciprocal machinery, robotic arms, etc., all exhibit movements which can be identified and accounted for during processing.

Any video alert system which uses frame-to-frame changes in the video to detect intrusions into a secured area is also vulnerable to false alarms from the inadvertent (passing automobile lights, etc.) or deliberate (police or security guard flashlights) introduction of light into the area, even though no one has physically entered the area. The system and method of the invention differentiate between a change in a video frame due to a change in the irradiation of the surfaces in the FOV (field of view) as in Fig. 5, and a change due to the introduction of a new reflecting surface in the FOV as in Fig. 3. The former is then rejected as a light "intrusion" requiring no alarm, whereas the latter is identified as a human intruder for which an alarm is given. It is important to remember that only the presence of a human intruder is of consequence to the security system, everything else constitutes a false alarm. It is the capability of the system and method of the invention to yield a high probability of detection of the presence of a human, while having a low probability of false alarms which constitutes a technically differentiated video security system. The video processing means of the present invention can also defeat the artifacts of noise, aliasing, screen savers, oscillating fans, drapery blown by air flow through vents, etc.

ALGORITHM PROCESS STEPS

The complete algorithm processes that are implemented by the method of the present invention are as follows:

Antialiasing;

Detection (Differencing and Thresholding)

Outlining;

Region Grower Segmentation;

Noise removal;

Shadow removal;

Tests for global and local lighting changes;

Masking;

Shape features;

Fourier Descriptors;

Object classification

ANTIALIASING PROCESS

The alias process is caused by sampling at or near the intrinsic resolution of the system. As the system is sampled at or near the Nyquist frequency, the video, on a frame by frame basis, appears to scintillate, and certain areas will produce Moire like effects. Subtraction on a frame by frame basis would cause multiple detections on scenes that are unchanging. In many applications where this occurs it is not economically possible to over sample. Elimination of aliasing effects is accomplished by convolving the image with an equivalent two-dimensional (2D) smoothing filter. Whether this is a 3 x 3 or 5 x 5 filter, or a higher filter, is a matter of preference as are the weights of the filter.

DETECTION PROCESS

The detection process consists of comparing the current image to a reference image. To initialize the system it is assumed that the operator has control over the scene and, therefore, will select a single frame for the reference when there is nothing present. (If necessary, up to 60 successive frames can be selected and integrated together to obtain an averaged reference image). As shown in Fig. 1, apparatus 10 employs multiple cameras C1-Cn, but the methodology with respect to one camera is applicable for all cameras. For each camera, an image is periodically selected and the absolute difference between the current image (suitably convolved with the antialiasing filter) and the reference is determined. The difference image is then thresholded (an intensity threshold) and all of the pixels exceeding the threshold are accumulated. This step eliminates a significant number of pixels that otherwise would result in a non-zero result simply by differencing the two images. Making this threshold value adaptive within a given range of threshold values ensures consistent

performance. If the count of the pixels exceeding the intensity threshold exceeds a pixel count threshold, then a potential detection has occurred. At this time, all connected hit pixels (pixels that exceed the intensity threshold) are segmented, and a count of each segmented object is taken. If the pixel count of any object exceeds another pixel count threshold, then a detection is declared. Accordingly, detection is defined as the total number of hit pixels in the absolute difference image being large and there is a large connected object in the absolute difference image.

With respect to noise, the key to rejecting noise induced artifacts is their size. Noise induced detections are generally spatially small and distributed randomly throughout the image. The basis for removing these events is to ascertain the size (area) of connected pixels that exceed the threshold set for detection. To achieve this, the region where the detected pixels occur is grown into connected "blobs". This is done by region growing the blobs. After region growing, those blobs that are smaller in size than a given size threshold are removed as false alarms.

REGION GROWER SEGMENTATION

Typically, a region growing algorithm starts with a search for the first object pixel as the outlining algorithm does. Since searching and outlining has already been performed, and since the outline pixels are part of the segmented object, these do not need to be region grown again. Outline pixel arrays are now placed on a stack, and the outline pixels are zeroed out in the absolute difference image. A pixel is then selected (removed from the stack) and the outline pixels are zeroed out in the absolute difference image. The selected pixel P and all of its eight neighbors P1-P8 (see Fig. 9) are examined to see if hit points occur (i.e. they are non- zero). If a neighbor pixel is non-zero, then it is added to the stack and zeroed out in the absolute difference image. Note that for region growing, all eight neighboring pixels are examined, whereas in outlining, the examination of neighboring pixels stops as soon as an edge pixel is found. Thus, in outlining, as few as one neighbor may be investigated. The

region growing segmentation process stops once the stack is empty.

One way to achieve the desired discrimination is to use an elaboration of the retinex theory introduced by Edwin Land some 25 years ago. Land's theory was introduced to explain why human observers are readily able to identify differences in surface lightness despite greatly varying illumination across a scene. Although the following discussion is with regards to a human observer, it will be understood that besides human vision, Land's theory is also applicable to viewing systems which function in place of a human viewer. According to the theory, even if the amount of energy reflected (incident energy times surface reflectance) from two different surfaces is the same, an observer can detect differences in the two surface lightness' if such a difference exists. In other words, the human visual system has a remarkable ability to see surface differences and ignore lighting differences. Land's hypothesis was that this ability derives from comparison of received energies across boundaries in the scene. Right at any boundary, light gradients make no difference because the energies received from adjacent regions on opposite sides of a boundary are in the correct ratio (the same as the ratio of reflectances). Furthermore, correct judgments about lightness' of widely separated regions are made by a serial process of comparisons across intervening regions. At first the theory was applied only to black and white scenes. Subsequently, it was extended to color vision by assuming that three separate retinex systems judge the lightness of surfaces in the three primary colors (red, green and blue). The retinex theory of color vision is able to explain why surface colors appear very stable to humans even though the nature of the illumination may change through a wide range.

It is the ability to discern surface differences and ignore lighting changes which is incorporated into the video security system and method of the present invention. Therefore, whether or not Land's theory correctly explains the way human vision operates, use of his concepts in the present invention make the system and method immune to light "intrusions".

A video signal (gray level) for any pixel is given by

$$g \propto \int E(\lambda)\, r(\lambda)\, S(\lambda)\, d\lambda \qquad (1)$$

where $E(\lambda) \equiv$ scene spectral irradiance at the pixel in question

$r(\lambda) \equiv$ scene spectral reflectance at the pixel in question

$S(\lambda) \equiv$ sensor spectral response

The constant of proportionality in (1) depends on geometry and camera characteristics, but is basically the same for all pixels in the frame.

The ratio of video signals for two adjacent pixels is:

$$\frac{g_1}{g_2} = \frac{\int E_1(\lambda) r_1(\lambda)\, S(\lambda)\, d\lambda}{\int E_2(\lambda) r_2(\lambda)\, S(\lambda)\, d\lambda} = \frac{\int E(\lambda) r_1(\lambda)\, S(\lambda)\, d\lambda}{\int E(\lambda) r_2(\lambda)\, S(\lambda)\, d\lambda} \qquad (2)$$

where we have used Land's approximation that the scene irradiance does not vary significantly between adjacent pixels: $E_1(\lambda) \equiv E_2(\lambda) \equiv E(\lambda)$. Assuming that the spectral reflectances are nearly constant over the spectral response of the camera, then $r_\kappa(\lambda) \equiv r_\kappa$ $= 1, 2$ and

$$\frac{g_1}{g_2} = \frac{r_1 \int E(\lambda)\, S(\lambda)\, d\lambda}{r_2 \int E(\lambda)\, S(\lambda)\, d\lambda} = \frac{r_1}{r_2} \qquad (3)$$

In other words, for the conditions specified, ratios of adjacent pixel values satisfy the requirement of being determined by scene reflectances only and are independent of scene illumination. It remains to consider the practicality of the approximations used to arrive at (3). A basic assumption in the retinex process is that of only gradual spatial variations in the scene irradiance; that is, we must have nearly the same irradiance of adjacent pixel areas in the scene. This assumption is generally true for diffuse lighting, but for directional sources it may not be. For example, the intrusion of a light beam into the area being viewed can introduce rather sharp shadows, or change the amount of light striking a vertical surface without similarly changing the amount of light striking an adjacent tilted surface. In these instances, ratios

between pixels straddling the shadow line in the first instance, or the surfaces in the second instance, will change even though no object has been introduced into the scene. However, even in these cases, with 512 by 484 resolution, the pixel-to-pixel change is often less than it appears to the eye, and the changes only appear at the boundaries, not within the interiors of the shadows or surfaces. By establishing a threshold on hits, the system can tolerate a number of these hits without triggering an intrusion alarm.

Another method, based on edge mapping, is also possible. As in the previous situation, the edge mapping process would be employed after an initial detection stage is triggered by pixel value changes from one frame to the next. Within each detected "blob" area, an edge map is made for both the initial (unchanged) frame and the changed frame that triggered the alert. Such an edge map can be constructed by running an edge enhancement filter (such as a Sobel filter) and then thresholding. If the intrusion is just a light change, then the edges within the blob should be basically in the same place in both frames. However, if the intrusion is an object, then some edges from the initial frame will be obscured in the changed frame and some new edges, internal to the intruding object, will be introduced.

Extensive laboratory testing revealed problems with both methods. In particular, it is difficult to set effective thresholds with the retinex method, because with a background and intrusive object both containing large uniform areas, many adjacent pixel ratios of unity in both the reference frame and the new frame are obtained. Therefore the fraction of ratios that are changed is diluted by those which contribute no information one way or the other. On the other hand, the edge mapping method shows undue dependence on light changes because typical edge masks use absolute differences in pixel values. Light changes can cause new edges to appear, or old ones to disappear, in a binary edge map even through there is no intervening object. By exploiting concepts from both methods, and key to this invention, an algorithm having both good detection and false alarm performance characteristics has been

constructed. Additional system features also help eliminate light changes of certain types which are expected to occur, so to further enhance performance.

The basic premise of the variable light rejection algorithm used in the method of the invention is to compare ratios of adjacent pixels from a segmented area in frame f1 with ratios from corresponding pixels in frame f3, but to restrict the ratios to those across significant edges. Restricting the processing to ratios of pixels tends to reject illumination changes, and using only edge pixels eliminates the dilution of information caused by large uniform areas.

In implementing the algorithm,

a) Ratios R of adjacent pixels (both horizontally and vertically) in frame f1 are tested to determine if they significantly differ from unity: $R-1 > T_1$? or $(1/R)-1 > T_1$?, where T_1 is a predetermined threshold value. Every time such a significant edge pair is found an edge count value is incremented.

b) Those pixel pairs that pass either of the tests in a) have their corresponding ratios R' for frame f3 calculated.

c) A check is made to see if R' differs significantly from the corresponding ratio R:

$|R'-R|/R > T_2$?, where T_2 is a second predetermined threshold value. Each time this test is passed a hit count value is incremented.

d) A test is made for new edges in frame f3 (i.e., edges not in frame f1): $R'-1 > T_1$? or $(1/R')-1 > T_1$? Every time such a new significant edge pair is found the edge count value is incremented again.

e) Those pixel pairs that pass either of the tests in d) have their corresponding ratios from frame f1, R, calculated.

f) A check is made to see if ratio R' differs significantly from the corresponding ratio R: $|R'-R|/R > T_2$? Each time this test is passed the hit count value is incremented again.

g) The segmented area is now deemed an intrusion if the ratio of changed edges to the edge count value (ecv) is sufficiently large: that is, there is an

intrusion if H/ecv $>T_3$, where T_3 is a third predetermined threshold value.

SHADOW REMOVAL

While the object is being outlined and segmented, the x and y coordinates of the pixels outlined and segmented are accumulated. This information is now used to calculate the centroid Z (see Fig. 6B) of the object. Also, the minimum and maximum x and y pixel coordinates of the object are computed at this time (see Fig. 6B). Both the centroid of the object and the object's minimum and maximum x, y coordinate values are used in a process to remove a shadow S (see Fig. 6A) from the object. Using the coordinate values, and assuming that life forms exhibit compact mass shapes, pieces of the object which stick out can be identified as a shadow and can be curtailed during subsequent processing. For drawing simplification, object O is shown in Fig. 4B with its shadow S removed.

SHAPE FEATURES

Having outlined and region grown an object to be recognized, a series of linear shape features and Fourier descriptors are extracted for each segmented region. Values for shape features are numerically derived from the image of the object based upon the x, y pixel coordinates obtained during outlining and segmentation of the object. These features include, for example, values representing the height of the object ($y_{max.} - y_{min.}$), its width ($x_{max.} - x_{min.}$), horizontal and vertical edge counts, and degree of circularity. However, it will be understood that there are a large number of factors relating to the features of an object and that some, or all, of the above listed features can be used with combinations of these other factors in order to classify an object. What is important is that any feature factor selected facilitate the distinction between a human and a non-human class of objects.

FOURIER DESCRIPTORS

Fourier descriptors represent a set of features used to recognize a silhouette or contour of an object. As shown in Fig. 6C, the outline of an object is resampled into equally spaced points located about the edge of the object.

The Fourier descriptors are computed by treating these points as complex points and creating a point complex FFT (Fast Fourier Transform) for the sequence. The resulting coefficients are a function of the position, size, orientation, and starting point P of the outline. Using these coefficients, Fourier descriptors are extracted which are invariant to these variables. As a result of performing the feature extractions, what remains is a set of features which now describe the segmented object.

FEATURE SET NORMALIZATION

The feature set obtained as described above is now normalized. For example, the set of features may be rescaled if the range of values for one of the features of the object is larger or smaller than the range which the rest of the features of the object have. Further, a test data base is established and when the feature data is tested on this data base, a feature may be found to be skewed. To eliminate this skewing, a mathematical function such as a logarithmic function is applied to the feature value. To further normalize the features, each feature value may be exercised through a linear function; that is, for example, a constant value is added to the feature value, and the result is then multiplied by another constant value. It will be understood that other consistent descriptors such as wavelet coefficients and fractal dimensions can be used instead of Fourier descriptors.

OBJECT CLASSIFIER

Having normalized a feature set, the set is now evaluated in order to classify the object which is represented by the set. An object classifier portion of the processor means is provided as an input the normalized feature set for the object to be classified. The object classifier has already been provided feature set information for humans as well as for a variety of animals (cat, dog, bird) such as shown in Figs. 7A - 7C. These Figs. show the presence of each animal in an actual scene as viewed by the camera of the system. By evaluation the feature set for the object with those for humans and animals, the classifier can determine a confidence value for each of three classes: human, animal and

unknown. Operation of the classifier includes implementation of a linear or non-linear classifier. A linear classifier may, for example implement a Bayes technique, as is well known in the art. A non-linear classifier may employ, for example, a neural net which is also well-known in the art, or its equivalent. Regardless of the object classifier used, operation of the classifier produces a "hard" decision as to whether the object is human, non-human, or unknown. Further, the method involves using the algorithm to look at a series of consecutive frames in which the object appears, perform the above described sequence of steps for each individual frame, and integrate the results of the separate classifications to further verify the result.

Depending upon the outcome of the above analysis, the processing means, in response to the results of the object classification provides an indication of an intrusion if the object is classified as a human. It does not provide any indication if the object is classified as an animal. This prevents false alarms. It will be understood, that because an image of a scene provided by a camera C is evaluated on a continual basis, every one-half second for example, the fact that a human is now present in the scene but the result of the classification process may not identify him as such at one instant, does not mean that the intrusion will be missed. Rather, it only means that the human was not recognized as such at that instant. Because the movement of a human intruder into and through the scene involves motion of the person's head, trunk, and limbs, their position or posture will be recognized as those of a human, if not in one image of the scene, then probably in the next. And, anytime the presence of a human intrusion is continually recognized in accordance with the method of the invention, the alarm is given. Moreover, if the result of an object classification is unknown, an alarm indication is also given. However, the level of the alarm is less than that for a classified human intrusion. What this lower level alarm does is to alert security personnel that something has occurred which may require investigation. This is important because while the system is designed to not provide false alarms, it is also designed to not miss any human

intrusions either. Because of the manner in which the algorithm is constructed, the possibility an object will be classified as unknown is very small. As a result, the instances in which a low level alarm will be sounded will be infrequent. This is a much different situation than sounding an alarm every time there is an anomaly.

An alarm, when it is given, is transmitted to a remote site such as a central monitoring location staffed by security personnel and from which a number of locations can be simultaneously monitored.

In view of the foregoing, it will be seen that the several objects of the invention are achieved and other advantageous results are obtained.

As various changes could be made in the above constructions without departing from the scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

Claims

1. A video security system visually monitoring a scene and detecting the presence of a human intruder within the scene comprising imaging means continually viewing the scene and producing a signal representative of the scene; processor means processing the signal, comparing the signal representing the scene at one point in time with a similar signal representing the scene at a previous point in time, and identifying those segments of the scene at said one point in time which differ from segments of the scene at the earlier point in time; and, discriminator means evaluating those segments of the scene identified as being different to classify each segment as a human life form or not, to give an alarm whenever an object present in one of the segments is classified as a human life form representing a human intruder within the scene, and to give no alarm if objects present in the segments are classified as non-human life forms.

2. The video security system of claim 1 wherein said discriminator means includes means comparing pixel elements contained in each segment of the scene at one point in time and corresponding pixel elements contained in a corresponding segment from the scene at the earlier point in time, and producing an outline of each segment within the later scene which differs from a corresponding segment in the earlier scene.

3. The video security system of claim 2 wherein said discriminator means further includes means growing each segment to a size which incorporates all of the pixels which define an object contained within the segment.

4. The video security system of claim 3 wherein said discriminator means further includes means extracting a set of features from the object.

5. The video security system of claim 4 wherein said feature extraction means includes means extracting linear shape features from the object as numerical values representing such factors as the height, width, horizontal and vertical edges of the object, and degree of circularity of the object.

6. The video security system of claim 4 wherein said feature extraction means further includes means extracting Fourier descriptors of the silhouette

shape features of the object.

7. The video security system of claim 6 wherein said feature extraction means further includes means normalizing any value obtained from the feature extraction means in the event said value falls outside a predetermined range of values for the particular feature.

8. The video security system of claim 6 wherein said discriminator means further includes classifier means evaluating said set of features for said object with sets of features representing human and non-human life forms and for deriving a value representing a degree of confidence as to the correspondence of the object to a human or non-human life form.

9. The video security system of claim 8 further including means providing an alarm indication only if the degree of confidence for the correspondence of the object to a human life form exceeds a predetermined confidence level.

10. The video security system of claim 8 wherein said classifier means includes a linear object classification means providing a confidence level output for each of the three classes: human, animal, and unknown.

11. The video security system of claim 8 wherein said classifier means includes a non-linear object classification means providing a confidence level output for each of three classes: human, animal, and unknown.

12. The video security system of claim 1 wherein said discrimination means includes means executing an algorithm to perform object classification.

13. The video security system of claim 4 wherein said feature extraction means includes means eliminating shadows cast by an object represented by the segment.

14. The video security system of claim 9 wherein said alarm indication means further provides a second alarm indication if an object is classified as unknown.

15. A video security system visually monitoring a scene and detecting motion of an object within the scene comprising imaging means continually viewing the scene and producing a signal representative of the scene; processor means processing said signal, comparing the signal representing the scene at one point in

time with a similar signal representing the scene at a previous point in time, and identifying those segments of the scene at said one point in time which differ from segments of the scene at the earlier point in time; and, discriminator means evaluating those segments of the scene identified as being different to determine if the differences are caused by surface differences which are indicative of the presence of an intruder within the scene, or lighting changes which occur within the scene and do not indicate the presence of an intruder, and if the difference is caused by the presence of an intruder providing an indication thereof, said discriminator means including means comparing pixel elements contained in each segment of the scene at the one point in time and corresponding pixel elements contained in a corresponding segment from the scene at the earlier point in time, and means determining a ratio of light intensity between each pixel in a segment with each pixel adjacent thereto, and means comparing the ratio values for the pixels in the segment of the scene at one point in time with the ratio values for the pixels in the corresponding segment of the scene at the earlier point in time.

16. A method of evaluating a scene to determine if any perceived movement within the scene is caused by an intruder into the scene comprising viewing the scene and creating an image of the scene, said image of said scene comprising a plurality of pixels arranged in an array; comparing the image of the scene with a reference image thereof to produce a difference image, producing said difference image including convolving the image with an antialiasing means to eliminate any aliasing effects in the resulting difference image, outlining any segments where a possible movement has occurred, determining a ratio of light intensity between each pixel in a segment with each pixel adjacent thereto, and comparing the ratio values for the pixels in a segment of one image with the ratio values for the pixels in the corresponding segment of other image; processing the difference image to identify any segments therewithin which, based upon a first predetermined set of criteria, represent spatially constrained movements of an object fixed within the scene, and further processing the difference image to identify any segments therewithin which, based upon a second predetermined set of criteria, represent

artifacts not caused by the presence of an intruder within the scene, said segments meeting said first and second sets of criteria being identified as segments not requiring further processing; and, further processing those segments within the difference image which remain to determine if movement therewithin is caused by an intruder.

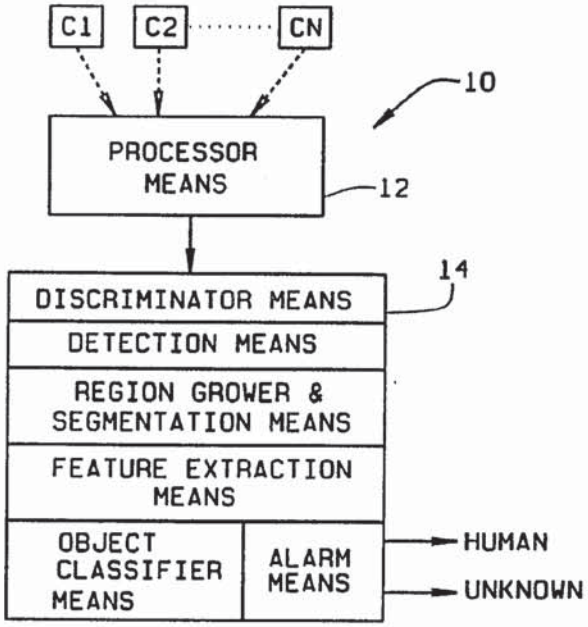

FIG. 1

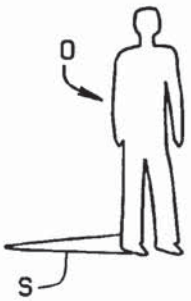

FIG. 6A

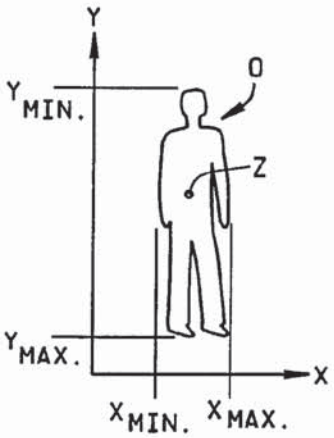

FIG. 6B

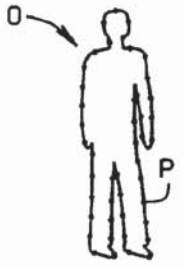

FIG. 6C

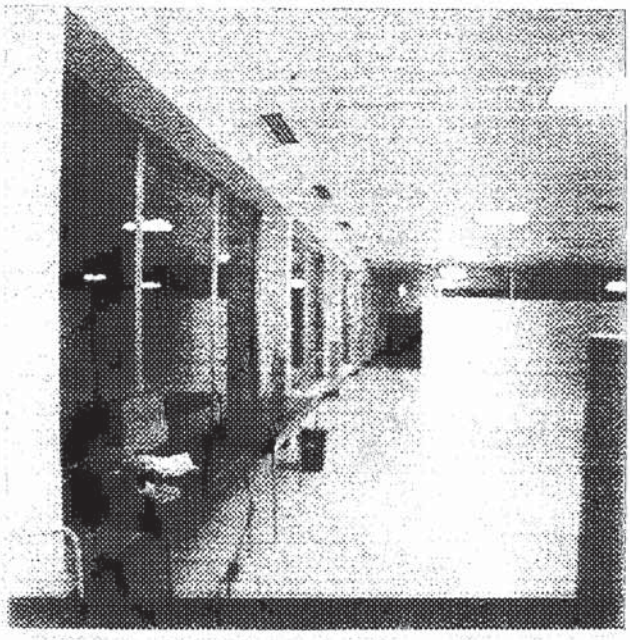

FIG. 2

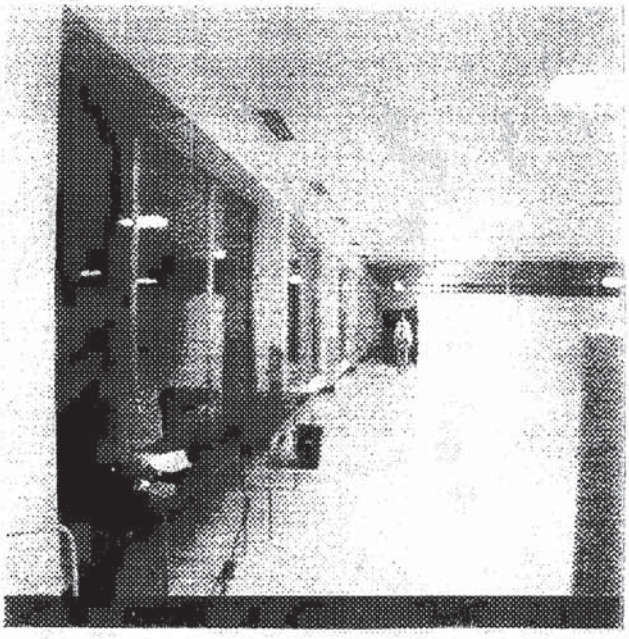

FIG. 3

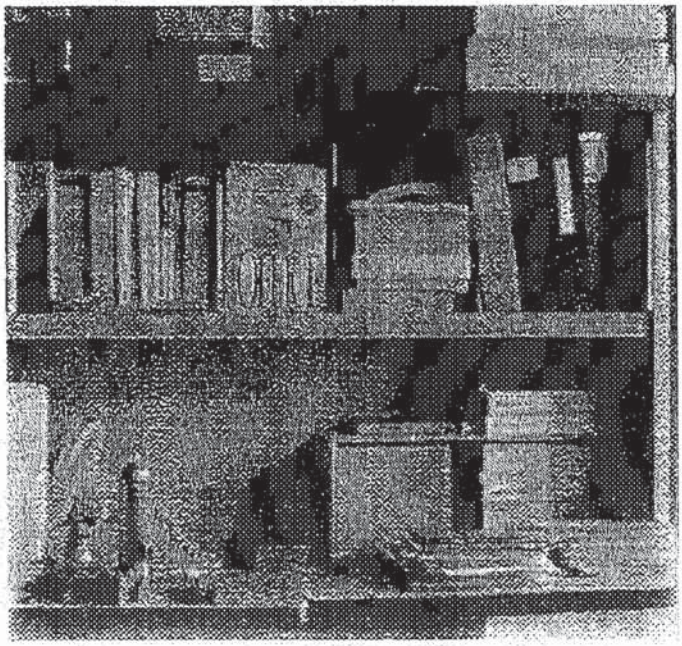

FIG. 4

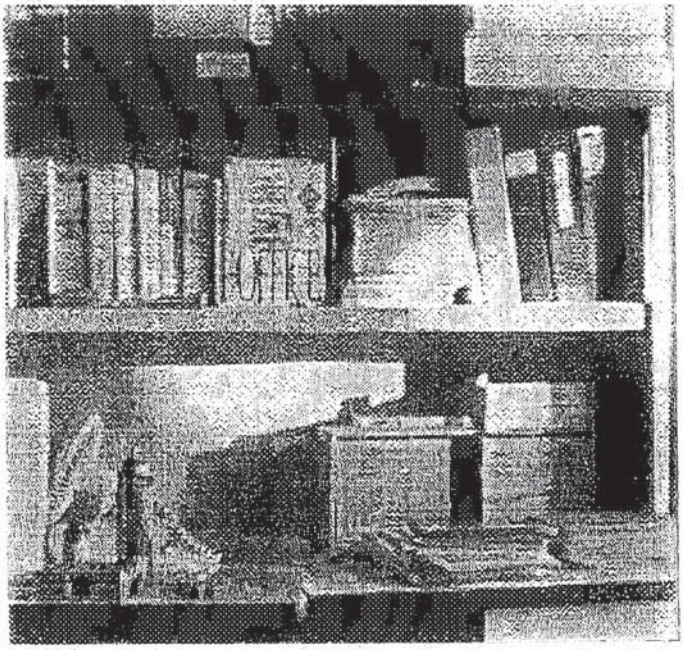

FIG. 5

FIG. 7A

FIG. 7B

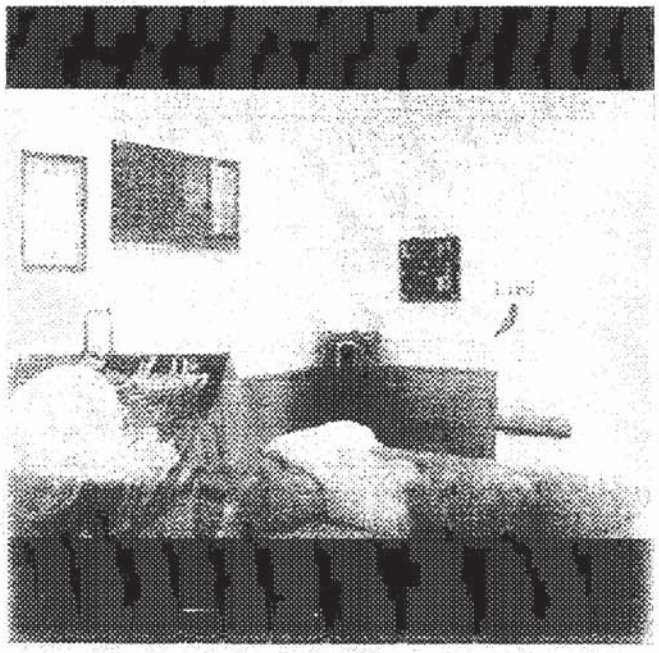

FIG. 7C

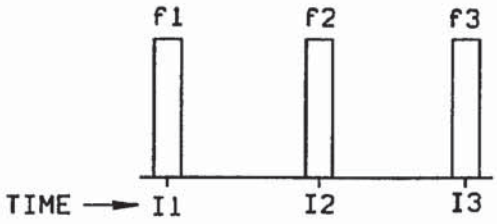

FIG. 8

P_1 P_2 P_3
P_4 P P_5
P_6 P_7 P_8

FIG. 9

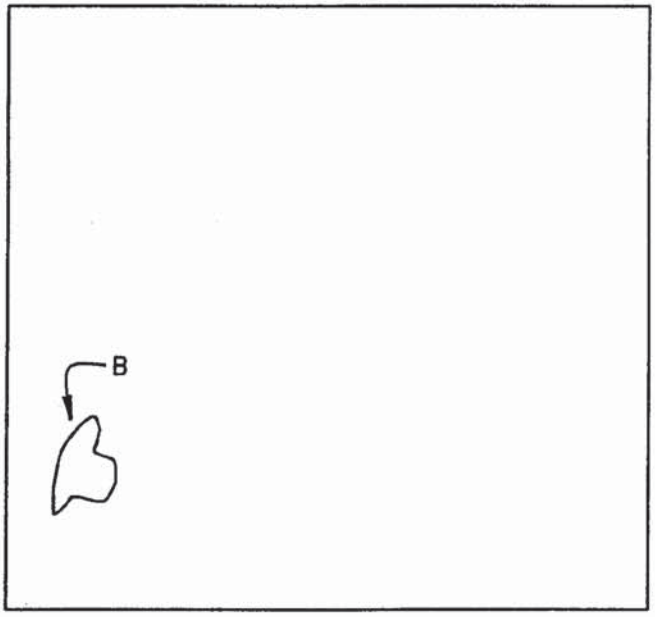

FIG. 10

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US97/24163

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) :G06K 9/20, 9/46; G08B 23/00; HO4N 7/18
US CL : 340/541; 348/152, 155; 382/203, 283
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 340/541, 441, 555; 348/152, 155, 154, 143, 399, 700; 382/203, 283, 100, 192, 153; 250/342

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

APS, STN
search terms: intru? and (scene# or image#), retinex, brightness(5a)change#

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
	Please See Continuation of Second Sheet.	

[X] Further documents are listed in the continuation of Box C. [ ] See patent family annex.

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"O"	document referring to an oral disclosure, use, exhibition or other means		
"P"	document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search 23 MARCH 1998	Date of mailing of the international search report 03 JUN 1998
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer David K Moore Telephone No. (703) 308-7452

Form PCT/ISA/210 (second sheet)(July 1992)*

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US97/24163

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y --- A	KANETA, M. et al. "Image Processing Method for Intruder Detection around Power Line Tower," IEICE Trans. Inf. & Syst., October 1993, vol. E76-D, No. 10, pages 1153-1160.	1-5, 12-13 ---------- 6-11, 14 ---------- 15-16
Y	GONZALEZ R.C. et al. "Digital Image Processing," Addison-Wesley Publishing, Reading, MA, 1977, pages 320-322, 345, 348-352, 383.	6-11, 14
Y	US 5,144,685 A (NASAR et al.) 01 September 1992, col. 10, line 59 to col. 12, line 13.	8-11, 14
Y	US 5,465,308 A (HUTCHESON et al.) 07 November 1995, col. 17, line 17 to col. 23, line 40.	11
Y	US 5,493,273 A (SMURLO et al.) 20 February 20 1996, col. 3, lines 18-21.	14

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APPLICATION NUMBER	FILING OR 371(c) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
11/692,430	03/28/2007	Mark Dronge	126.107

CONFIRMATION NO. 7545

22846
BRIAN ROFFE, ESQ
11 SUNRISE PLAZA, SUITE 303
VALLEY STREAM, NY11580-6111

Title: SECURITY ALARM SYSTEM

Publication No. US-2007-0230744-A1
Publication Date: 10/04/2007

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Pre-Grant Publication Division, 703-605-4283

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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
11/692,430	03/28/2007	2624	540	126.107	22	3

CONFIRMATION NO. 7545

UPDATED FILING RECEIPT

22846
BRIAN ROFFE, ESQ
11 SUNRISE PLAZA, SUITE 303
VALLEY STREAM, NY11580-6111

Date Mailed: 05/10/2007

Receipt is acknowledged of this regular Patent Application. It will be considered in its order and you will be notified as to the results of the examination. Be sure to provide the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION when inquiring about this application. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please mail to the Commissioner for Patents P.O. Box 1450 Alexandria Va 22313-1450. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections (if appropriate).**

Applicant(s)

Mark Dronge, Tenafly, NJ;

Power of Attorney: The patent practitioners associated with Customer Number 22846

Domestic Priority data as claimed by applicant

This appln claims benefit of 60/743,894 03/29/2006
and claims benefit of 60/804,660 06/14/2006

Foreign Applications

If Required, Foreign Filing License Granted: 04/05/2007

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US11/692,430**

Projected Publication Date: 10/04/2007

Non-Publication Request: No

Early Publication Request: No

** SMALL ENTITY **

Title

SECURITY ALARM SYSTEM

Preliminary Class

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This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

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espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371 (c) DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NUMBER
11/692,430	03/28/2007	Mark Dronge	126.107

CONFIRMATION NO. 7545

22846
BRIAN ROFFE, ESQ
11 SUNRISE PLAZA, SUITE 303
VALLEY STREAM, NY 11580-6111

FORMALITIES LETTER

Date Mailed: 04/06/2007

NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION

FILED UNDER 37 CFR 1.53(b)

Filing Date Granted

Items Required To Avoid Abandonment:

An application number and filing date have been accorded to this application. The Item(s) indicated below, however, are missing. Applicant is given **TWO MONTHS** from the date of this Notice within which to file all required items and pay any fees required below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

- The statutory basic filing fee is missing.
  Applicant must submit $ **300** *to complete the basic filing fee for a non-small entity. If appropriate, applicant may make a written assertion of entitlement to small entity status and pay the small entity filing fee (37 CFR 1.27).*
- The oath or declaration is missing. *A properly signed oath or declaration in compliance with 37 CFR 1.63, identifying the application by the above Application Number and Filing Date, is required.*
  Note: If a petition under 37 CFR 1.47 is being filed, an oath or declaration in compliance with 37 CFR 1.63 signed by all available joint inventors, or if no inventor is available by a party with sufficient proprietary interest, is required.

The applicant needs to satisfy supplemental fees problems indicated below.

The required item(s) identified below must be timely submitted to avoid abandonment:

- Additional claim fees of $**100** as a non-small entity, including any required multiple dependent claim fee, are required. Applicant must submit the additional claim fees or cancel the additional claims for which fees are due.
- To avoid abandonment, a surcharge (for late submission of filing fee, search fee, examination fee or oath or declaration) as set forth in 37 CFR 1.16(f) of $130 for a non-small entity, must be submitted with the missing items identified in this letter.

04/20/2007 CCHAU1 00000016 11692430

01 FC:4011 75.00 OP
02 FC:2111 250.00 OP
03 FC:2311 100.00 OP
04 FC:2051 65.00 OP
05 FC:2202 50.00 OP

SUMMARY OF FEES DUE:

Total additional fee(s) required for this application is $**1230** for a non-small entity.

- **$300** Statutory basic filing fee.
- **$130** Surcharge.

- The application search fee has not been paid. Applicant must submit **$500** to complete the search fee.
- The application examination fee has not been paid. Applicant must submit **$200** to complete the examination fee for a non-small entity.

- Total additional claim fee(s) for this application is **$100**

  - **$100** for **2** total claims over 20.

Replies should be mailed to: Mail Stop Missing Parts
Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

Registered users of EFS-Web may alternatively submit their reply to this notice via EFS-Web.
https://sportal.uspto.gov/authenticate/AuthenticateUserLocalEPF.html

For more information about EFS-Web please call the USPTO Electronic Business Center at **1-866-217-9197** or visit our website at http://www.uspto.gov/ebc.

If you are not using EFS-Web to submit your reply, you must include a copy of this notice.

Office of Initial Patent Examination (571) 272-4000, or 1-800-PTO-9199
PART 2 - COPY TO BE RETURNED WITH RESPONSE

Attorney Docket No. 126.107

UNITED STATES PATENT AND TRADEMARK OFFICE

Re:	Application of:	Mark Dronge
	Serial No.:	11/692,430
	Filed:	March 28, 2007
	For:	Security Alarm System
	Confirmation No.:	7545
	Customer No.:	22846

RESPONSE TO NOTICE TO FILE
MISSING PARTS OF NONPROVISIONAL APPLICATION

Mail Stop Missing Parts
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

April 16, 2007

Sir:

In response to the Notice to File Missing Parts of Nonprovisional Application dated April 6, 2007 (a copy of which is enclosed), submitted herewith is a properly signed Declaration for Patent Application. Small Entity Status is claimed.

A Form 2038 for payment of the basic filing fee of $75 (based on electronic filing), application search fee of $250, application examination fee of $100, surcharge of $65, and additional fees of $50 (totaling $540), all based on small entity status, is enclosed.

FIRST CLASS MAIL CERTIFICATION
I hereby certify that this correspondence and/or fee is being deposited with the United States Postal Service as first class mail in an envelope addressed to "Mail Stop Missing Parts, Commissioner for Patents, P.O. Box 1450 Alexandria, VA 22313-1450" on April 16, 2007

Harry Scaline

Harry Scaline

Any deficiency or overpayment of fees for this application should be charged or credited to Deposit Account No. 50-1268.

An early and favorable action on the merits is earnestly solicited.

Respectfully submitted,

By:_____
Brian Roffe
Attorney for Applicant
Reg. No. 35,336

Brian Roffe, Esq.
11 Sunrise Plaza, Suite 303
Valley Stream, New York 11580-6111
Tel.: (516) 256-5636
Fax: (516) 256-5638

Enclosures
Copy of Notice to File Missing Parts (2 pages)
Declaration for Patent Application (2 pages)
Information Disclosure Statement (6 pages)
One Article Reference (4 pages)
Credit Card Payment Form (PTO-2038)

DECLARATION AND POWER OF ATTORNEY FOR U.S. NON-PROVISIONAL PATENT APPLICATION

As a below named inventor, I hereby declare that:

Each inventor's residence, mailing address, and citizenship are as stated below next to their name.

I believe the inventor(s) named below to be the original and first inventor(s) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

SECURITY ALARM SYSTEM

the specification of which was filed on March 28, 2007 as U.S. patent application Ser. No. 11/692,430.

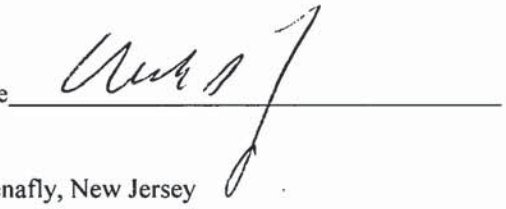
I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the patentability as defined in 37 C.F.R. §1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT International filing date of the continuation-in-part application.

I hereby appoint the attorney(s) and/or agent(s) associated with Customer Number 22846 to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. §1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of sole inventor, (given name, family name) Mark Dronge

Inventor's signature  Date 4/13/07

Residence Tenafly, New Jersey Citizenship U S A

Post Office Address: 33 Kenwood Road, Tenafly, New Jersey 07670

Attorney Docket No. 126.107

UNITED STATES PATENT AND TRADEMARK OFFICE

Re:	Application of:	Mark Dronge
	Serial No.:	11/692,430
	Confirmation No.	7545
	Filed:	March 28, 2007
	For:	Security Alarm System
	Customer Number:	22846

INFORMATION DISCLOSURE STATEMENT

Mail Stop Non Fee
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

April 16, 2007

Sir:

Applicant herewith submits a list of references potentially material to the subject matter of the above-referenced application. Since this application is being filed after June 30, 2003, the requirement for a copy of the U.S. patent publications has been waived. A copy of the article reference and an abstract of each of the foreign patent references are enclosed.

This submission does not represent that a search has been made or that no better prior art exists. While the term "reference" is used in citing each of the publications called to the Examiner's attention herein, applicant does not make any admission that each or all of them are "prior art" references within the meaning of the statutory and case law.

Applicant reserves the right to contend, where appropriate, that a reference asserted against any claim of the present application is not prior art under the facts and the law.

Applicant also reserves the right to present appropriate arguments and/or evidence to establish patentability over the references, should one or more of the references be applied against the claims of the present application.

Applicant respectfully requests that the Examiner independently determine those items that the Examiner would consider the most pertinent of all the references cited herein.

It is respectfully requested that these references be considered and made of record.

Respectfully submitted,

By:_____
Brian Roffe
Attorney for Applicant
Reg. No. 35,336

Brian Roffe, Esq.
11 Sunrise Plaza, Suite 303
Valley Stream, New York 11580-6111
Tel.: (516) 256-5636
Fax: (516) 256-5638

Enclosure
PTO-1449 (6 pages)
One Article Reference (4 pages)
Foreign Patent Abstracts (7 pages)

PTO/SB/08a (08-03)
Approved for use through 07/31/2006. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	11692430
Filing Date	2007-03-28
First Named Inventor	Mark Dronge
Art Unit	2624
Examiner Name	
Attorney Docket Number	126.107

U.S.PATENTS						
Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	4679077		1987-07-07	Yuasa et al.	
	2	5283551		1994-02-01	Guscott	
	3	5473311		1995-12-05	Hoseit	
	4	5576972		1996-11-19	Harrison	
	5	5748775		1998-05-05	Tsuchikawa et al.	
	6	5864640		1999-01-26	Miramonti et al.	
	7	5963148		1999-10-05	Sekine et al.	
	8	6532901		2003-03-18	Isley et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	11692430
	Filing Date	2007-03-28
	First Named Inventor	Mark Dronge
	Art Unit	2624
	Examiner Name	
	Attorney Docket Number	126.107

	9	6542170		2003-04-08	Ito et al.	
	10	6782847		2004-08-31	Shemesh et al.	
	11	6864789		2005-03-08	Wolfe	

If you wish to add additional U.S. Patent citation information please click the Add button.

U.S.PATENT APPLICATION PUBLICATIONS

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20040215750		2004-10-28	Stilp	
	2	20040233287		2004-11-25	Schnell	
	3	20050011466		2005-01-20	Doyle II	
	4	20050151851		2005-07-14	Schnell	

If you wish to add additional U.S. Published Application citation information please click the Add button.

FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	11692430
	Filing Date	2007-03-28
	First Named Inventor	Mark Dronge
	Art Unit	2624
	Examiner Name	
	Attorney Docket Number	126.107

	1	JP1140396			1989-06-01	Takuji et al.		☐
	2	JP5064198			1993-03-12	Atsushi et al.		☐
	3	JP5328355			1993-12-10	Takaiwa et al.		☐
	4	JP7050825			1995-02-21	Hideo et al.		☐
	5	WO9828706			1998-07-02	Wootton et al.		☐
	6	DE10122294			2003-03-27	Reinhard		☐
	7	JP2004077350			2004-03-11	Nobuyasu		☐

If you wish to add additional Foreign Patent Document citation information please click the Add button

NON-PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	"TAC I/NET Seven Security", TAC, Jan. 2006	☐

If you wish to add additional non-patent literature document citation information please click the Add button

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	11692430
	Filing Date	2007-03-28
	First Named Inventor	Mark Dronge
	Art Unit	2624
	Examiner Name	
	Attorney Docket Number	126.107

EXAMINER SIGNATURE			
Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number	11692430
	Filing Date	2007-03-28
	First Named Inventor	Mark Dronge
	Art Unit	2624
	Examiner Name	
	Attorney Docket Number	126.107

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ None

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	Brian Roffe	Date (YYYY-MM-DD)	2007-04-16
Name/Print	Brian Roffe	Registration Number	35,336

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

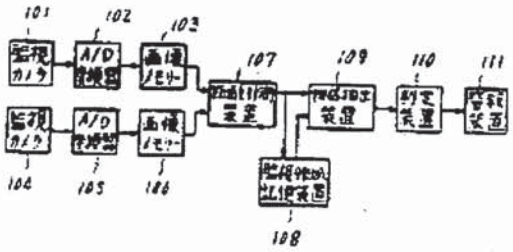
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

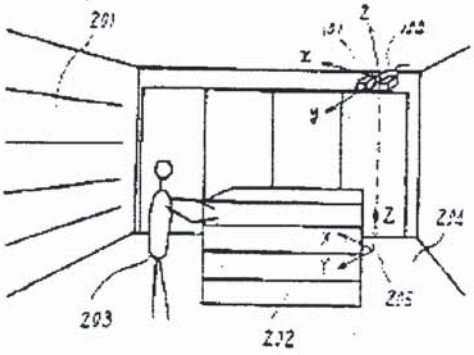
SECURITY SUPERVISING DEVICE

Patent number: JP1140396
Publication date: 1989-06-01
Inventor: NISHITANI TAKUJI; TOMITA YASUHIRO; FUNABASHI SEIJU
Applicant: HITACHI LTD;; HITACHI MICROCUMPUTER ENG
Classification:
- International: G06F15/70; G08B13/18; G08B21/00
- european:
Application number: JP19870297592 19871127
Priority number(s): JP19870297592 19871127

Abstract of **JP1140396**

PURPOSE:To prevent an erroneous alarm from generating by processing a picture inputted from a supervising camera, measuring the distance of an object in a supervising environment, comparing a distance measured result in a state without any invaded object and the distance measured result at the time of supervising, and deciding the existence, the position, and the size of the invaded object. CONSTITUTION:A supervised area memory device 108 sets the area of the environment to be supervised based on the output result of distance measuring equipment 107 for picture data photographed in the state without the invaded object and stores the set area, an object extractor 109 compares the output of the distance measuring equipment 107 which can be obtained one after another at the time of supervising and the supervised area stored in the supervised area memory device 108 and extracts the distance measured result for the invaded object. A deciding device 110 decides the existence of the invaded object based on the output of the object extractor 109, and when the invaded object exists, the deciding device 110 calculates the size and position of the invaded object. An alarming device 111 generates an alarm when the invaded object exists, and further, the size of the invaded object is larger than a constant value previously determined. Thus, the erroneous alarm due to the change of lighting conditions and the invasion of a small animal can be eliminated.





PCT WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 6 : G06K 9/20, 9/46, G08B 23/00, H04N 7/18 | A1

(11) International Publication Number: **WO 98/28706**

(43) International Publication Date: 2 July 1998 (02.07.98)

(21) International Application Number: PCT/US97/24163

(22) International Filing Date: 23 December 1997 (23.12.97)

(30) Priority Data:

08/772,595	23 December 1996 (23.12.96)	US
08/771,991	23 December 1996 (23.12.96)	US
08/772,731	23 December 1996 (23.12.96)	US

(71) Applicant: ESCO ELECTRONICS CORPORATION [US/US]; Suite 200, 8888 Ladue Road, St. Louis, MO 63124 (US).

(72) Inventors: WOOTTON, John, R.; 700 Rugby Court, St. Louis, MO 63141 (US). WALDMAN, Gary, S.; 12934 Walnut Way, St. Louis, MO 63146 (US). HOBSON, Gregory, L.; 17 Upper Dardenne Farms Drive, St. Charles, MO 63304 (US).

(74) Agent: MULLER, J., Joseph; Polster, Lieder, Woodruff & Lucchesi, 763 South New Ballas Road, St. Louis, MO 63141 (US).

(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, GW, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).

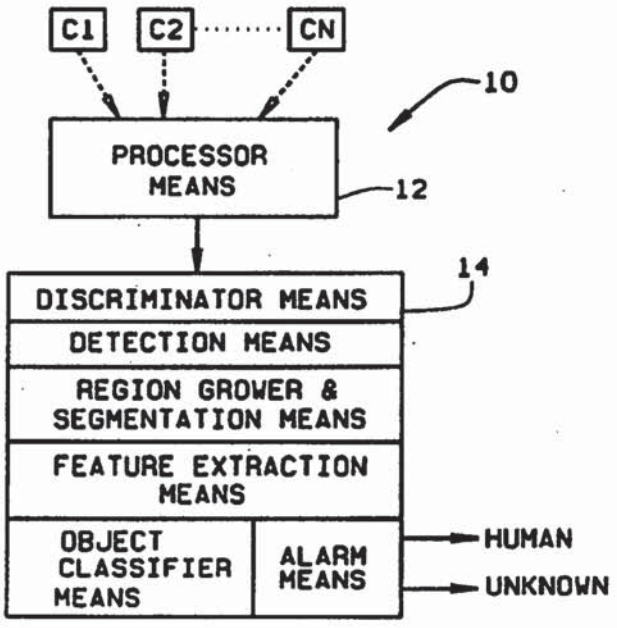
Published
With international search report.
With amended claims.

Date of publication of the amended claims:
11 September 1998 (11.09.98)

(54) Title: LOW FALSE ALARM RATE VIDEO SECURITY SYSTEM USING OBJECT CLASSIFICATION

(57) Abstract

A video detection system (10) and method detects an intruder from video images of a scene. The method employs a recognition process to differentiate between humans and animals. The method is used only after possible false alarms resulting from identified effects of noise, aliasing, non–intruder motion occuring within the scene, and effects of global or local lighting changes. The object recognition process includes determining the regions containing a potential intruder, outlining and growing those regions to encompass all of potential intruders, determining a set of shape features from the region and eliminating possible shadow effects, normalizing the set, and comparing the normalized set with sets of features of humans and animals. This comparison produces a confidence level indicating a human intruder. An alarm is given for a sufficiently high confidence level. The possibility of a false alarm due to an animal or a non–identifiable object is also substantially eliminated.

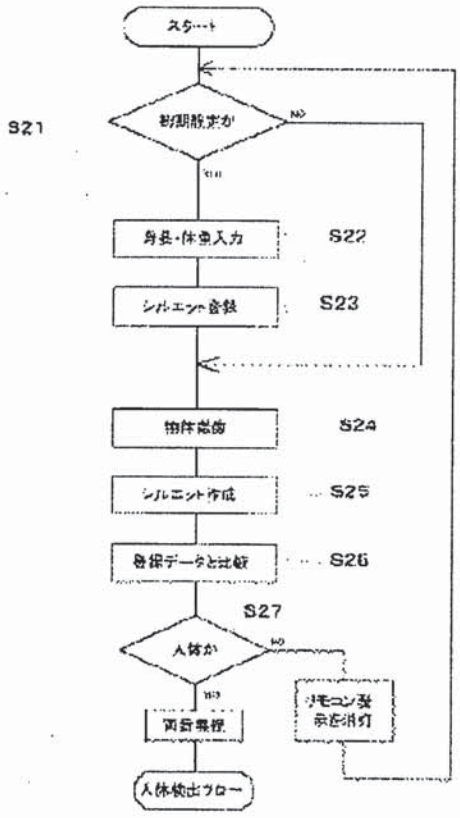


HUMAN BODY DETECTOR

Patent number:	JP2004077350
Publication date:	2004-03-11
Inventor:	HIRAOKA NOBUYASU
Applicant:	NORITZ CORP
Classification:	
- international:	G01V8/10; G08B13/196; G08B25/00
- european:	
Application number:	JP20020240028 20020821
Priority number(s):	JP20020240028 20020821

Abstract of **JP2004077350**

<P>PROBLEM TO BE SOLVED: To provide a human body detector free from erroneous detection with enhanced certainty of human body detection by adding technical improvement to a detecting method for motions of the human body. <P>SOLUTION: This detector is provided with an imaging device for imaging an object, a silhouette acquiring means for acquiring a silhouette of the object based on difference in tint between pixel data on the imaged object and pixel data on the background of the object, previously registered silhouette information on normal persons, a comparison means for comparing silhouette information acquired by the acquiring means with the registered silhouette information, and a human body determining means for determining that it is a human body if approximation is found as a result of comparison by the comparison means. There is no fear of detecting the motion of a dog or a cat except human bodies. Since a human body is determined by acquiring its silhouette, only human bodies can be detected, certainty of human body detection is enhanced, and there is no concern of erroneous detection. <P>COPYRIGHT: (C)2004,JPO



Alarm system for frightening away animals from a pond or fish farm has an infrared detection area that is used to trigger an electronic dog recording and flashing lights

Patent number:	DE10122294
Publication date:	2003-03-27
Inventor:	MOERT REINHARD (DE)
Applicant:	MOERT REINHARD (DE)
Classification:	
- international:	A01M29/02
- european:	A01M29/00C3; A01M29/02; A01M31/00A
Application number:	DE20011022294 20010908
Priority number(s):	DE20011022294 20010908

Abstract of **DE10122294**

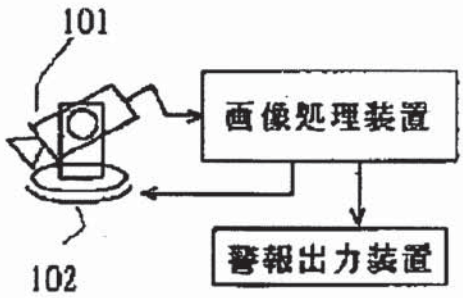
Alarm system for ponds and fish farms comprises an alarm within a plastic housing. The alarm is triggered when an animal enters an infrared detection area and causes an electronic dog recording, pulsed white flashing light, etc. If animals have become used to white light a blue, green, red or yellow filter can be used.

HUMAN BEING AND ANIMAL MONITOR SYSTEM

Patent number:	JP7050825
Publication date:	1995-02-21
Inventor:	MORI HIDEO; MATSUSHITA TAKESHI
Applicant:	MORI HIDEO
Classification:	
- international:	H04N7/18; G06T1/00; G06T7/00; G08B25/00
- european:	
Application number:	JP19930157814 19930524
Priority number(s):	JP19930157814 19930524

Abstract of **JP7050825**

PURPOSE:To obtain the monitor system able to recognize a person or a kind of an animal invaded in a monitor area by detecting a height and width and a rhythm of walking of a person or an animal with a TV camera or an infrared ray camera. CONSTITUTION:An image pickup device 101 using a black/white TV camera or an infrared ray TV camera is mounted to a turning base 102 and installed toward a monitor area. A picture processing unit binarizes an inter-frame difference picture in the case of a black/white TV picture, and '1' is set to pixels of a threshold level or over and '0' is set to pixels less than the threshold temperature level in the difference. In the case of an infrared ray picture, '1' is set to pixels of a threshold level or over and '0' is set to pixels less than the threshold temperature level in the difference and the area whose pixels are set to '1' is selected to be a moving body area. Then the moving body area is traced to decide whether a moving body is a person or an animal based on the height, the width, the area and the walking rhythm, its kind, position and speed are outputted from an alarm output section. Through the constitution above, a person or an animal is distinguished from a moving vehicle such as an automobile and a tree rustling in the wind and whether the moving object is a person or an animal is recognized.



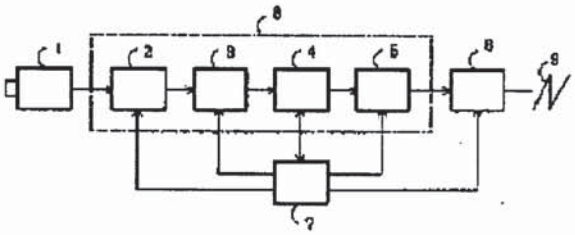
BURGLAR CAMERA DEVICE

Patent number: JP5328355
Publication date: 1993-12-10
Inventor: NAKAYA TAKAIWA; OKADA ATSUSHI; URAMOTO YASUNARI
Applicant: SHARP KK;; EZEL INC
Classification:
- international: H04N7/18; H04N5/225
- european:
Application number: JP19910141252 19910517
Priority number(s): JP19910141252 19910517

Report a data error here

Abstract of **JP5328355**

PURPOSE:To prevent the misdispatch of a guardian and to reduce line capacity by finding out the height of the centroid of a moving object, and only at the time of judging that the moving object is a human body based upon the height of the centroid, transmitting an image to a central monitoring center. CONSTITUTION:An image processing part 6 takes in a background image through a camera 1, and when a change is generated in the image, regards the change as the appearance of a moving object and removes the background. Then the many-valued image of only the moving object is binarized and labeling processing is applied to the binary image to find out the area of the moving object. When a difference between the obtained area value and the area value of an image obtained immediately after is less than a prescribed value, the existence of the moving object in a monitoring area is judged and its centroid is calculated. Only when the height of the centroid is included within a fixed range corresponding to the height of the centroid of a human body, an alarm and an image of an invader are sent from a transmitting equipment to the monitoring center through a communication line 9. Consequently the generation of a misalarm due to a non-organism, an inanimate object a small animal, or the like can be prevented.

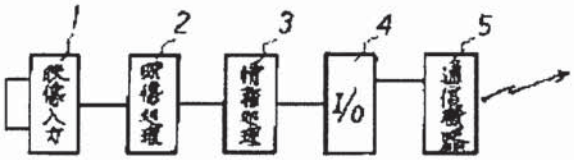


BURGLAR ALARM SYSTEM

Patent number: JP5064198
Publication date: 1993-03-12
Inventor: OKADA ATSUSHI; NAKAYA TAKAYOSHI
Applicant: SHARP KK
Classification:
- international: G08B13/196; H04N7/18
- european:
Application number: JP19910222757 19910903
Priority number(s): JP19910222757 19910903

Abstract of **JP5064198**

PURPOSE:To raise alarm to a center only when an invader and a small animal are discriminated automatically and the invader is in existence by applying remote near correction to the size of a mobile body from fetched picture information so as to calculate the size. CONSTITUTION:Picture information fetched from a video input device such as a burglar preventing camera and processed by a video processing unit is inputted to an information processing unit 3. Then whether or not the size is a reference size or over is discriminated based on a lower end coordinate of a mobile object subject to remote near correction by the processing unit 3 and on the size to discriminate an intruder from a small animal. Only in the case of the intruder, in response to the automatic discrimination of the intruder, an alarm is sounded to a management center through an I/O 4 and a communication equipment 5. Thus, the small animal and the intruder are distinguished automatically and alarm is raised only to the intruder.



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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
11/692,430	03/28/2007	2624	0.00	126.107	22	3

CONFIRMATION NO. 7545

22846
BRIAN ROFFE, ESQ
11 SUNRISE PLAZA, SUITE 303
VALLEY STREAM, NY11580-6111

FILING RECEIPT

Date Mailed: 04/06/2007

Receipt is acknowledged of this regular Patent Application. It will be considered in its order and you will be notified as to the results of the examination. Be sure to provide the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION when inquiring about this application. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please mail to the Commissioner for Patents P.O. Box 1450 Alexandria Va 22313-1450. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections (if appropriate).**

Applicant(s)

Mark Dronge, Residence Not Provided;
David Amels, Residence Not Provided;

Power of Attorney: None

Domestic Priority data as claimed by applicant

This appln claims benefit of 60/743,894 03/29/2006
and claims benefit of 60/804,660 06/14/2006

Foreign Applications

If Required, Foreign Filing License Granted: 04/05/2007

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US11/692,430**

Projected Publication Date: To Be Determined - pending completion of Missing Parts

Non-Publication Request: No

Early Publication Request: No

Title

SECURITY ALARM SYSTEM

Preliminary Class

382

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APPLICATION NUMBER	FILING OR 371 (c) DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NUMBER
11/692,430	03/28/2007	Mark Dronge	126.107

CONFIRMATION NO. 7545

22846
BRIAN ROFFE, ESQ
11 SUNRISE PLAZA, SUITE 303
VALLEY STREAM, NY 11580-6111

FORMALITIES LETTER

Date Mailed: 04/06/2007

NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION

FILED UNDER 37 CFR 1.53(b)

Filing Date Granted

Items Required To Avoid Abandonment:

An application number and filing date have been accorded to this application. The item(s) indicated below, however, are missing. Applicant is given **TWO MONTHS** from the date of this Notice within which to file all required items and pay any fees required below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

- The statutory basic filing fee is missing.
  Applicant must submit $ **300** *to complete the basic filing fee for a non-small entity. If appropriate, applicant may make a written assertion of entitlement to small entity status and pay the small entity filing fee (37 CFR 1.27).*
- The oath or declaration is missing. *A properly signed oath or declaration in compliance with 37 CFR 1.63, identifying the application by the above Application Number and Filing Date, is required.*
  Note: If a petition under 37 CFR 1.47 is being filed, an oath or declaration in compliance with 37 CFR 1.63 signed by all available joint inventors, or if no inventor is available by a party with sufficient proprietary interest, is required.

The applicant needs to satisfy supplemental fees problems indicated below.

The required item(s) identified below must be timely submitted to avoid abandonment:

- Additional claim fees of $**100** as a non-small entity, including any required multiple dependent claim fee, are required. Applicant must submit the additional claim fees or cancel the additional claims for which fees are due.
- To avoid abandonment, a surcharge (for late submission of filing fee, search fee, examination fee or oath or declaration) as set forth in 37 CFR 1.16(f) of $130 for a non-small entity, must be submitted with the missing items identified in this letter.

SUMMARY OF FEES DUE:

Total additional fee(s) required for this application is $**1230** for a non-small entity

- **$300** Statutory basic filing fee.
- **$130** Surcharge.

- The application search fee has not been paid. Applicant must submit **$500** to complete the search fee.
- The application examination fee has not been paid. Applicant must submit **$200** to complete the examination fee for a non-small entity.

- Total additional claim fee(s) for this application is **$100**

  - **$100** for **2** total claims over 20.

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Office of Initial Patent Examination (571) 272-4000, or 1-800-PTO-9199
PART 3 - OFFICE COPY

SECURITY ALARM SYSTEM

Cross Reference to Related Applications

This application claims priority under 35 U.S.C. §119(e) of U.S. provisional patent application Ser. No. 60/743,894 filed March 29, 2006 and U.S. provisional patent application Ser. No. 60/804,660 filed June 14, 2006, both of which are incorporated by reference herein.

Field of the Invention

The present invention relates generally to an alarm system which is designed to determine whether a threat to private property exists and more particularly, to an alarm system for a house or other structure where the presence of a threat is primarily posed by wild animals.

The present invention also relates to an alarm system for determining the presence of a threat posed by wild animals to an unoccupied house or other structure and which provides for remote activation of security features to reduce or eliminate the potential threat.

Background of the Invention

In the prior art, there are numerous alarm systems which are installed in connection with houses and other structure for alerting residents or security personnel to a threat to the house or the individuals therein. For example, alarm systems are known which generate loud noises when a door is opened without authorization or a window is broken, and/or which notify security personnel of such conditions to enable such personnel to respond to the house.

Some patents and patent publications that describe such security systems include: U.S. Patent Nos. 4,697,077 (Yuasa et al.), 5,283,551 (Guscott), 5,576,972 (Harrison), 5,825,412 (Hobson et al.), 5,937,092 (Wootton et al.), 6,069,655 (Seeley et al.), 6,400,265 (Saylor et al.), German Patent Publication No. DE 10122294, International Patent Publication No. WO 98/28706 (WO '706) and Japanese Patent No. JP2004077350 (JP '350).

Guscott describes an intrusion alarm system including a triggering sensor and a linear array of sensors triggered to sample an area of interest when activated by the triggering sensor. Differences in the sample infrared emissions enable a determination of the object as a human or a dog.

Harrison describes a monitoring system including various sensors, one of which is an optical sensor, and data from all of the sensors is directed to a neural network computer which analyzes the data and detects and identifies the objects in the sensed area which may be people, animals or objects.

Hobson et al. describes a video detection system for monitoring railroad crossings wherein a camera views the railroad crossing and establishes the presence of objects and the size thereof. An alarm is sounded based on the size of the object.

Wootton et al. describes a security system in which images of a detection area are sensed and compared with previously obtained images to determine the presence and movement of an intruder in the detection area. In this regard, reference is made to Yuasa et al. which is said to describe use of a frame subtraction technique to derive the presence of an object and conveyance of this information to a remote location for viewing by a human.

Seeley et al. describes a security system in which video cameras send images from a site

control unit (SCU) to a central station which may be remote from the SCU. Video signals from the cameras are directed to an image processor section which determines the presence of an intruder and classifies the intruder.

Saylor et al. describes a security system wherein images obtained from a security camera are transmitted over the Internet to be seen on a computer. Other ways to be informed of the existence of an alarm condition are also mentioned.

German Patent Publication No. DE 10122294 describes an alarm system which undertakes different actions based on detection of an animal in a detection area.

WO '706 describes a video detection system in which different objects are recognized by comparing a set of shape features (e.g., an outline), derived from comparison of an instantaneously obtained image to previously obtained images, to sets of features of humans and animals.

JP '350 describes a technique for determining whether an object is a human by comparing the silhouette of the object to previously registered silhouette information.

Objects and Summary of the Invention

It is an object of the present invention to provide a new and improved an alarm system which is better able determine whether a threat to private property exists.

It is another object of the present invention to provide a new and improved alarm system for a house or other structure where the presence of a threat primarily posed by wild animals is accurately detected in order to optimize a response.

It is yet another object of the present invention to provide a new and improved alarm

system for determining the presence of a threat posed by wild animals to an unoccupied house or other structure and which provides for remote activation of security features to reduce or eliminate the potential threat.

In order to achieve these objects and others, a security system in accordance with the invention is designed to distinguish or discriminate between animals and humans with a view toward accurately determining a threat to private property which requires a response. The security system includes one or more motion detectors connected to one or more cameras which are connected to a computer which is connected in turn to a data communication or transmission device that can inform a homeowner off premises, the police, fire department and/or private security firm of the existence of an intrusion condition based on the images obtained by the camera.

In use, a motion detector detects motion in the field of view of an associated camera which then obtains one or more images, which presumably include the cause of the motion. A processor connected with the camera derives a silhouette of the object that triggered the motion from the obtained image(s), through image comparison with images taken without the object therein. A processor analyzes the silhouettes by comparing them to previously obtained silhouettes, such as those of various animals and humans having different sizes. A classification of the silhouette is obtained and depending on what object the silhouette is determined to correspond to, i.e., its identification, further action or countermeasures is taken. This further action may be: the object is classified as "no threat" and the system stays in stand-by or the object is classified as "hostile" or a threat and a message or warning is sent to a distant computer, the property's owner's homepage, the police and/or a private security firm.

More specifically, one embodiment of an alarm system for protecting a structure in accordance with the invention includes at least one motion detector arranged to have a field of view external of the structure and including an area proximate the structure, and at least one camera associated with each motion detector, each camera being arranged relative to the associated motion detector such that it has a field of view encompassing at least part of the field of view of the associated motion detector. Each camera has a dormant state in which images are not obtained and an active state in which images are obtained and being activated into the active state when the associated motion detector detects motion such that that camera obtains an image of the source of the motion detected by the associated motion detector. A processor is coupled to each camera and arranged to receive the image obtained thereby, derive a silhouette of any objects in the image, compare the silhouettes to a library of stored silhouettes having associated object identification to determine an exact or closest match of the derived silhouette to one of the stored silhouettes and retrieve the object identification associated with the exact or closest match. The processor reacts to the detection of motion by the motion detector based on the object identification.

Various associations of the cameras and motion detectors are possible. There may be a one-to-one correspondence or association between motion detectors and cameras, i.e., each motion detector has a single and exclusive camera whose field of view encompasses the field of view of the motion detector. There may be an overlapping camera arrangement wherein each motion detector is associated with two or more cameras (preferably located at different positions) whose field of view partly or entirely encompasses the field of view of the motion detector. In this manner, two images including the source of motion are obtained and independently analyzed

in the manner described above. Different rules of object identification can be formulated for situations where the object identification is different. For each motion detector, there may be an exclusive set of two or more cameras, or alternatively, each camera can be associated with more than one motion detector so that it obtains an image when any of its associated motion detectors detects motion.

When two or more cameras obtain images of or containing the same object, which may arise in a situation where these cameras have an overlapping field of view relative to a single motion detector and are all activated by motion detected by that motion detector, images from cameras containing the object may be analyzed by the processor to obtain depth information about the object. This is similar to a stereo-vision concept and various techniques to derive depth information about an object contained in two or more images from different imaging devices or cameras are known to those skilled in the art. The depth information can be used to aid the processor in the object identification task, i.e., the object classification. This aspect of using multiple cameras to obtain images containing a common object, derive depth information about the object and use the depth information to obtain an identification of the object may be applied independent of the presence and particular arrangement of motion detectors and cameras described above. However, the presence of motion detectors to activate the cameras would be beneficial. Thus, one embodiment of the invention contemplates multiple cameras associated with each of at least one motion detector and arranged to be activated to obtain images of an object whose motion is detected by those cameras. These images can be analyzed to obtain depth information about the object, i.e., the distance from a known object to this moving object, and also to obtain identification information about this object for the purpose of determining

whether this identified object at the determined distance is a threat.

As to the processor's reaction to the object identification, it can be programmed to assign a classification of "no threat" or "hostile" based on the object identification. The library of stored silhouettes preferably includes silhouettes of large and small animals and large and small humans in which case, the processor can be programmed to assign the hostile classification to large animals and humans and the no threat classification to small animals and humans. Other possible differentiations of classifications may be based on size. When a hostile classification is generated, the processor also preferably activates countermeasures based on the object identification. For example, the processor can command the alarm system to generate the audible and/or visual alarm in proximity to the structure and/or command a communication system to generate a communications about the condition of the structure and forward the communication to the remote destination, e.g., a police station, a fire station, a terminal monitored by an owner of the structure, or a private security station. The communication can include one or more images obtained by the camera(s) or one or more images derived from the images obtained by the camera(s).

An exemplifying method for protecting a structure in accordance with the invention includes arranging a plurality of motion detectors on or around the structure, each in a position in which its field of view includes an area proximate the structure, and arranging a plurality of cameras on or around the structure, each camera being associated with one or more of the motion detector such that the camera has a field of view encompassing at least part of the field of view of any associated motion detector. The cameras have a dormant state in which images are not obtained and an active state in which images are obtained and are activated into the active state

when an associated motion detector detects motion such that the camera then obtains an image of the source of the motion detected by the associated motion detector. A processor is provided which receives images obtained by the cameras, derives a silhouette of any objects in the image, compares the silhouettes to a library of stored silhouettes having associated object identification to determine an exact or closest match of the derived silhouette to one of the stored silhouettes and retrieves the object identification associated with the exact or closest match. One or more countermeasures to the detection of motion by the motion detectors are generated based on the object identification when the object is identified as a potential threat to the structure.

A classification of "no threat" or "hostile" can be assigned by the processor based on the object identification, in which case, the countermeasure can be generated only when the classification is hostile. Countermeasures can include generating an audible and/or visual alarm in proximity to the structure and/or generating at least one communication about the condition of the structure based on the object identification and forwarding the communication to the remote destination, e.g., a police station, a fire station, a terminal monitored by an owner of the structure, or a private security station. The communication can include one or more images obtained from the cameras and/or one or more images derived from the images obtained from the cameras in the communication being forwarded to the remote destination.

Another method for monitoring a premises in accordance with the invention includes arranging an alarm system in connection with the premises, integrating a telecommunications module in connection with a computer of the alarm system, the telecommunications module being capable of communications over a telecommunications network, and programming the telecommunications module to receive commands from a handheld telecommunications unit over

the telecommunications network to enable activation and deactivation of the alarm system using the telecommunications unit. The alarm system may include video cameras which obtain images of the premises, in which case, the images of the premises obtained by the video cameras can be transmitted upon receiving a command from the handheld telecommunications unit.

When the telecommunications unit is a cellular telephone, it can transmit a code number to the telecommunications module to control activation, deactivation and adjustment of the alarm system. When the telecommunications unit is a messaging device, it can transmit a message to the telecommunications module to control activation, deactivation and adjustment of the alarm system. When the telecommunications unit is a camera telephone and the alarm system includes video cameras which obtain images of the premises, the images of the premises obtained by the video cameras can be transmitted to the camera telephone upon satisfaction of threat conditions as determined by the alarm system.

A system for monitoring a premises in accordance with the invention includes an alarm system arranged in connection with the premises and including various sensors, cameras and the like for detecting a threat to the premises and a telecommunications module in connection with the sensors or a control component thereof. The telecommunications module is capable of communications over a telecommunications network. A handheld telecommunications unit is provided for transmitting commands to the telecommunications module to activate, deactivate and adjust the alarm system. The telecommunications unit may be an existing unit owned by the homeowner or alarm system monitor, such as a cellular telephone, iPod, PDA, laptop computer or desktop computer and the like.

When the alarm system includes video cameras which obtain images of the premises, it

can transmit still-frame or motion picture images of the premises obtained by the video cameras upon receiving a command from the telecommunications unit. When the telecommunications unit is a cellular telephone, it can transmit a code number to the telecommunications module to control activation, deactivation and adjustment of the alarm system. When the telecommunications unit is a messaging device, it can transmit a message to the telecommunications module to control activation, deactivation and adjustment of the alarm system. When the telecommunications unit is a camera telephone and the alarm system includes video cameras which obtain images of the premises, the alarm system can transmit still-frame or motion picture images of the premises obtained by the video cameras to the camera telephone upon satisfaction of threat conditions as determined by the alarm system.

Other and further objects, advantages and features of the present invention will be understood by reference to the following specification in conjunction with the annexed drawings, wherein like parts have been given like numbers.

Brief Description of the Drawings

The invention, together with further objects and advantages thereof, may best be understood by reference to the following description taken in conjunction with the accompanying drawings wherein like reference numerals identify like elements.

FIG. 1 is a schematic of a first embodiment of an alarm system in accordance with the invention.

FIG. 2 is a flow chart of the manner in which an object is classified in the alarm system in accordance with the invention.

FIG. 3 is an overview of a house equipped with the alarm system in accordance with the invention.

FIG. 4 is a schematic of a second embodiment of an alarm system in accordance with the invention.

Detailed Description of the Invention

Referring to the accompanying drawings, FIG. 1 shows a schematic of one exemplifying embodiment of an alarm system in accordance with the invention which includes, at the site at which the alarm system is installed, one or more motion detectors 10, one or more cameras 12 and an on-site computer 14.

Each motion detector 10 is mounted to the house, apartment or other premises or structure being monitored, hereinafter referred to as a house for simplicity sake, or on a structure around the house which could be dedicated to the mounting of the motion detector 10. For example, a motion detector could be mounted to the exterior wall of the house, to a post around the house, to a tree around the house, or to the roof of the house. The premises or structure being monitored may be any type of premises or structure which is typically monitored for security purposes, including but not limited to, a warehouse, a boatyard, a business, a boat, or a land vehicle such as one with a locating system.

Each motion detector 10 is mounted such that its field of view, i.e., the field in which it detects motion, is around the house in which an intruder could approach the house. For example, a motion detector 10 could be arranged to have a field of view in a path leading to the house, a field of view encompassing a length of a fence around the house or a field or a field of view

adjacent the house, e.g., adjacent one or more windows of the house.

With reference to FIG. 3 wherein the outline of a generic house 34 is shown, there are four motion detectors 10A, 10B, 10C, 10D mounted to the house 34 at its corners so as to provide overlapping fields of view. Each field of view 36A, 36B, 36C and 36D extends over an approximate 180 degree range a sufficient distance from the house, the exact distance depending on the type and construction of the motion detector installed in the alarm system. Of course, the number, placement and coverage area of the motion detectors will usually vary depending on such factors as the plan outline of the house, the location of doors and windows and the surrounding area.

Motion detectors 10 can be standard, off-the-shelf components which provide a signal indicative of the presence of motion above a threshold. In this case, small objects which might be blown aloft by wind, such as leaves, would not trigger the motion detector to provide an output signal. Further, the particular motion detectors selected could be those which only detect animate objects, e.g., humans or animals. In this case, if a fence post in a field of view of a motion detector 10 is being tilted by the wind, it would also not cause the motion detector to provide an output signal.

Each camera 12 is mounted to the house or on a structure around the house which could be dedicated to the mounting of the camera 12. For example, a camera could be mounted to the exterior wall of the house, to a post around the house, to a tree around the house, or to the roof of the house.

The mounting location of each camera 12 is selected in dependence on its field of view and the field of view of the motion detector 10 or motion detectors 12 with which it is associated.

That is, in a preferred embodiment, each camera 12 is triggered to obtain an image only when its associated motion detector 10 detects motion in the field of view of the motion detector 10. Since it is this motion (or the cause thereof) for which an image is sought, one or more of the cameras 12 must be positioned to be able to obtain an image of the portion of the field of view of the motion detector 10 in which motion is detected thereby. In some situations, a single camera 12 can be associated with each motion detector 10 and have substantially overlapping fields of view so that when the motion detector 10 detects motion in its field of the view, the camera 12 is triggered to obtain an image which will necessarily encompass the source or cause of that motion. In other situations, two or more cameras 12 can be associated with each motion detector 10 and be spaced apart from one another. Each camera 12 would have a substantially overlapping field of view with the motion detector 10 so that when the motion detector 10 detects motion in its field of the view, both cameras 12 are triggered to obtain images which will necessarily encompass the source or cause of that motion. The use of multiple cameras for each motion detector 10 will aid in the subsequent image processing routine, discussed more fully below.

It is also possible that a single camera 12 has a field of view which encompasses the field of view of multiple motion detectors 10. In this case, when any of a plurality of motion detectors 10 detects motion, that camera 12 will be triggered to obtain an image.

With reference to FIG. 3, eight cameras 12A, 12B, 12C, 12D, 12E, 12F, 12G, 12H are shown mounted to the house 34 along its outer wall so as to provide overlapping fields of view. Each field of view 38A, 38B, 38C, 38D, 38E, 38F, 38G, 38H extends over an approximate 180 degree range a sufficient distance from the house, the exact distance depending on the type and

construction of the cameras installed in the alarm system. As shown in FIG. 3, each field of view 36A, 36B, 36C and 36D of the motion detectors 10A, 10B, 10C and 10D overlaps with a plurality of fields of view 38A, 38B, 38C, 38D, 38E, 38F, 38G, 38H of cameras 12A, 12B, 12C, 12D, 12E, 12F, 12G, 12H. Thus, when motion is detector by one of the motion detectors 10, several cameras 12 will be triggered to obtain images. For example, when motion is detected by motion detector 10A, cameras 12A, 12B, 12C and 12D will obtain images.

Cameras can also be provided to visualize the house, or parts thereof, e.g., a camera can be mounted on a post distant from the door and directed toward the door to obtain an image of the house including the door. The same would also be applicable for images of the windows.

Of course, the number, placement and coverage area of the cameras will usually vary depending on such factors as the location of the motion detectors, the plan outline of the house, the location of doors and windows and the surrounding area.

Cameras 12 can be standard, off-the-shelf components which obtain images in individual frames and as in some conventional cameras, can be equipped with a light which is triggered when the ambient light is less than a threshold. Cameras can also be used which are infrared cameras which obtain infrared images. This is possible since, as discussed below, only the outline of the object causing the motion is needed for image processing.

The on-site computer 14 is connected to all of the cameras 12. On-site computer 14 can also be connected to the motion detectors 10 and control the cameras 12, i.e., the image-taking step, based on signals provided by the motion detectors. Alternatively, the cameras 12 are directly connected to the associated motion detector(s) 10 and take an image without involvement of the on-site computer 14.

An advantage of coupling the cameras 12 to the motion detectors 10 is that the cameras do not continually operate and obtain images of the environment around or including the house. Rather, the cameras 12 are only activated to obtain images when motion is detected by the associated one(s) of the motion detectors 10. This conserves electricity or battery power and is thus especially useful when the cameras are operating on battery power.

Computer 14 includes hardware and software components which perform, among other functions, image processing. That is, the computer 14 receives data from the cameras 12, in any form in which images can be conveyed electronically, and analyzes the images in a unique manner to analyze the threat level of the source of the motion. It is possible that only a single camera 12 will be taking an image of the area surrounding the house and providing this image in electronic form to the in-site computer 14. Alternatively, the on-site computer 14 will receive images from multiple cameras 12, all triggered by one motion detector, or from multiple cameras triggered by motion detected by multiple motion detectors, e.g., when the source of motion moves through the fields of view of multiple motion detectors.

A preferred image processing technique is shown schematically in FIG. 2. The first step 22 for on-site computer 14 is to obtain an image. The image processing step is explained for the individual processing of a single image. If multiple images are received from the cameras 12, the image processing technique shown in FIG. 2 would be implemented for each image or depending on the processing software, could be implemented substantially simultaneously.

The second step 24 is to outline or derive a silhouette of an object in the image, this object being the one which caused the motion detector 10 to trigger the taking of the image by the camera 12. Each image will usually contain multiple objects, the silhouette of only one of

which will be analyzed at each time. Thus, if several objects are detected in each image, for each object, an analysis will be made as whether that objects poses a threat to the house or its occupants. To reduce the number of objects being analyzed, a background image can be taken when the camera 12 is first installed on the house 34. Then, when another image is taken with the same camera, the background image can be subtracted from the current image to obtain differences between the current image and the background image and only object in this differential image are analyzed, e.g., by deriving a silhouette thereof. The background images would be stored in the on-site computer with an identification of the camera providing the background image and whenever an image is taken from a camera and received by the on-site computer 14, its stored background image is subtracted from the received image. Alternatively, the background image for each camera 12 can be stored on a processor associated with the camera and the subtraction performed at the camera so that only the differential image is provided to the on-site computer 14.

The third step 26 is to compare the derived silhouette of each object in the image to a library of stored silhouettes to determine the exact or closest correspondence between the derived silhouette and one or the stored silhouettes. The library is embodied in memory of the on-site computer 14 and includes silhouettes of objects expected to be found in the vicinity of the house. In particular, silhouettes of various animals and various sized humans are obtained, e.g., derived from images of known objects, and each silhouette is associated with the identity of the object providing the silhouette.

Silhouette derivation can be based on a number of descriptors that are typical for the human body, or on other factors which can be used to distinguish, discriminate and/or

differentiate different objects and in particular, animals from humans. Silhouette derivation can also be designed to distinguish between large animals, such as bears, and small animals, such as cats and dogs, and between large humans and small humans. For humans, the on-site computer 14 can be designed to consider a silhouette of a human smaller than that of an average 8-year old not to be a threat while a silhouette of a human larger than that of an average 8-year old is considered a threat.

If the silhouette is determined to a human, an optional additional analysis might be made based on the duration of time that the individual is present on the premises. A threshold time period could be established and if the individual remains on the premises for longer than this threshold, they may be considered a threat whereas remaining on the premises for less time, would not be considered a threat.

After the silhouette of an object in the image is derived in step 24 and compared to stored silhouettes in step 26, the next step 28 is to determine whether the derived silhouette is indicative of a threat to the house being protected by the alarm system or occupants therein. Prior to installation of the system, the different objects are determined to constitute or pose a threat or not and silhouettes of those objects are stored in the library. In use, once the derived silhouette is determined to be an exact or probable match to one of the stored silhouettes, the identification of the objects associated with the stored silhouette is retrieved and considered the identity of the object causing the motion detected by the motion detector 10.

The on-site computer 14 may be programmed to perform the silhouette comparison and object identification based on the location of the house being protected and likely objects in that location. Thus, a deer and small human might be considered not to be a threat whereas a bear and

large human might be considered a threat. The actual determination of whether each object constitutes a threat or not can depend on the environment of the house being protected so that one object in one environment might be considered a threat whereas the same object in a different object is not considered a threat.

The determination can entail assigning a class or classification to the object corresponding to the stored silhouette with which the derived silhouette is determined to be an exact or probable match, e.g., a classification of "no threat" or a classification of "hostile".

If the object corresponding to the stored silhouette with which the derived silhouette is determined to be an exact or probable match is not considered a threat, the alarm system enters into a sleep mode 30. In this mode, the alarm system waits for another incident of motion to be detected by one of the motion detectors 10 which causes an image to be taken by one or more cameras 12 and the image processing via on-site computer 14 begins again.

If the object corresponding to the stored silhouette with which the derived silhouette is determined to be an exact or probable match is considered hostile or a threat, in step 32, countermeasures are assigned based on the identification of the object. Countermeasures include generating an audible and/or visual alarm at the house, generating a communication to police personnel, fire personnel and/or a private security firm, and generating a communication to the homeowner. The communication generated by on-site computer 14 can be sent in a wired and/or wireless manner using any communication protocol. The communication can be sent to the homeowner's computer at a remote or distant location from the house being protected, and appear on the homeowner's homepage, or sent to an SMS or MMS or as an e-mail to the homeowner's e-mail address.

The communication can include an identification of the house or other object or premises being monitored, a message or warning specific to the identified object as determined by the on-site computer 14 and also preferably the image obtained by the camera 12 which caused the on-site computer 14 to generate the communication. The image in the communication can be the actual image, e.g., in a JPEG or other known image format, or a silhouette of the image. A derivation of the image can also be provided as part of the communication.

The communication can also include an image taken from all of the cameras monitoring the house. In particular, images can be generated and sent from cameras directed toward the house so that images of the house and its condition are provided as part of the communication.

When the image which caused the on-site computer 14 to generate the communication is provided as part of the communication, in particular when the communication is sent to police or fire personnel, the police and fire personnel can prepare a better response. Thus, if the image reveals the presence of multiple people, more police or file personnel can be directed to respond.

Furthermore, when the images of cameras showing the house or parts thereof is provided as part of the communication, in particular when the communication is sent to police or fire personnel, the police and fire personnel can prepare a better response. Thus, if the image reveals that no door is ajar and the windows are not broken, fewer police would be directed to respond as it is likely that the alarm is a false alarm or the intruders were scared away by the audible and/or visual countermeasures.

In a preferred embodiment, the alarm/security system is designed to be controlled by and/or provide data to a handheld telecommunications unit 42 (see FIG. 1) which can be a camera telephone, a cellular telephone, an Internet-enabled picture and/or video display device

(e.g., an iPod-type device), and similar products. To this end, in the on-site computer 14, and possibly in a dedicated alarm hardware unit therein, there is a telecommunications module which the alarm system uses to communicate with the user or alarm monitor, i.e., whichever individual monitors the alarm system by possessing the telecommunications unit 42. The telecommunications module may be the telecommunications part of an advanced camera telephone or cellular telephone and include, for example, the necessary hardware and software to enable communications with a comparable telecommunications device.

An important advantage of integrating or incorporating a telecommunications unit from a camera telephone or cellular telephone into the on-site computer of the alarm system is that it becomes possible to activate the alarm using the telecommunications unit 42, from any location connected to a telecommunications network compatible with the telecommunications unit 42. Activating the alarm system can therefore be accomplished with only so much as a simple telephone call, a SMS with an ordinary cell phone, and the alarm system will be able to communicate with whomever it is programmed to communicate with, i.e., the house/apartment owner, police or fire department, or whomever it is programmed to communicate with. Deactivating the alarm system can be accomplished in the same manner.

Thus, control over the activation and deactivation of the alarm system, as well as other adjustment to the alarm system, can now be performed using a handheld telecommunications unit 42, whether it is cellular telephone or a camera telephone or other similar unit, such as a PDA. The handheld telecommunications unit 42 could be programmed to relay passwords to enable adjustment and control of the alarm system, or programmed to interface in any other manner with the alarm system using a telecommunications network.

An additional advantage of integrating the alarm system into a telecommunications network is that when the alarm system is triggered (or when the user provides commands to the telecommunications module using the telecommunications unit 42), it can send real-time pictures or video feed from the camera(s) 12 mounted inside/outside a house or apartment to a camera telephone monitored by the owner or other alarm system monitor. The alarm system can also send vital information collected by different kinds of sensors (fire, smoke, motion) or whatever data gathering devices are hooked up to the alarm system.

This telecommunications link allows someone distant from their house or apartment to check their house or apartment, e.g., by dialing a code number in the same way as a telephone number is dialed and/or sending an SMS to the alarm system. The code number would be assigned to the alarm system, or programmed by the owner. Multiple code numbers could be assigned, each with a different function. Upon receipt of the code number or SMS, the alarm system would send pictures or videos from the camera(s) 12 back to telecommunications unit 42. This provides an incentive for people to purchase cameras capable of receiving images or services for enabling transmission of pictures in that they can receive pictures of monitored premises whenever an alarm condition is detected. The alarm security system could be packaged together with such a picture telephone.

There are thus at least two ways to monitor the premises using the handheld telecommunications unit 42. One way is for the user to enter a code, send a message or take some other action to cause the cameras 12 to obtain and transmit images of the vicinity of the premises (a user-activated monitoring), and the other way is when the alarm system triggers and sends images. In the latter case, the handheld telecommunications unit 42 can be programmed or

designed to generate a notification to the user that the alarm has triggered and/or that images are being provided. Such a notification can be audible, vibratory, visual and combinations thereof.

The telecommunications link also allows a user to deactivate the alarm when the approach the premises and activate the alarm as they leave the premises by using their cellular telephone.

One particular scenario that should interest security companies as well as police and fire departments is that they can survey the premises being protected, e.g., a house or apartment, using the video camera(s) 12 in order to assess a threat level, false alarms, the number of intruders, smoke or raging flames, etc., before entering premises as the camera(s) 12 give them a complete picture of what to expect. This can even be done before they respond to the premises, for example, on their way to the premises.

Another scenario is if a homeowner in bed at night hears a noise in their house. The homeowner no longer needs to leave the safety and confines of his or her bedroom to investigate the source of the noise and thereby risk confrontation with an intruder. Rather, the homeowner can view pictures taken by one or more cameras 12 on a telecommunications unit 42 in the bedroom, e.g., on their night-table.

In another embodiment, one or more smoke and/or fire detectors 40 are arranged inside the house 34 (see FIG. 3) and coupled to the on-site computer 14. In this embodiment, when any of the smoke and/or fire detectors 40 is triggered based on the presence of smoke in the house 34 or a fire in the house 34, the on-site computer sends a communication to the fire personnel containing information about the premises and the existence of smoke and/or fire. Optionally, cameras can be located inside the house 34 and coupled to the smoke and/or fire detectors 40 so

that when the smoke and/or fire detectors 40 are triggered, the associated camera(s) is/are also activated to obtain images of the cause of the smoke or fire condition. Such images can be transmitted in the communication by the on-site computer 14 to the fire personnel.

Referring now to FIG. 4, this embodiment is substantially the same as the embodiments described above however instead of separate motion detectors and cameras, the camera functions as both the unit which detects motion and the identification unit. Specifically, one or more cameras 44 are provided which can obtain images and analyze them to detect the presence of motion of an object. At this stage, there is no identification of the object but rather analysis of the images may be limited to solely detecting motion. Once motion is detected, images previously obtained to enable the motion detection analysis and/or those obtained after the motion detection analysis are analyzed for identification purposes. The cameras can thus be designed to have a first, motion detecting state in which images are used only for motion detection analysis and a second identification detecting state in which images are analyzed to classify an object causing the motion. Moreover, cameras can be designed to simultaneously provide motion detection and object identification.

Functioning of a camera as both a motion detector and object identifier can be enabled through software which controls the analysis of images obtained by the camera. Motion detection algorithms can be utilized to analyze pictures taken at different times, e.g., a comparison of two images taken from the same camera with an object in each, while object identification algorithms can be utilized to analyze individual pictures to identify objects and/or ascertain the presence of threats to the monitored premises based on data in the images.

Cameras used in the invention may have two simultaneous modes, motion detection and

video notification. Thus, they can be designed to obtain multiple images to analyze the presence of motion of objects in those images and also to transmit via a telecommunications link one or more of the obtained images.

Described above, among other things, is a technique for control and feedback for an alarm system using a camera telephone, cellular telephone or other preferably hand-held telecommunications device. The same technique can be used for an Internet-enabled video iPod-type device, i.e., a device which receives image or video data in the form of files via the Internet. An additional or alternative technique for implementation in an alarm system in accordance with the invention is threat recognition by video analysis. The alarm system can be programmed to automatically recognize a threat in advance using video detection. A determination of normal objects on the premises is first made and then, during monitoring by the alarm system, the alarm system employs digital signal processing and image comparison to differentiate between an animal or inanimate object, and/or a moving object as opposed to a stationary person or object.

While particular embodiments of the invention have been shown and described, it will be obvious to those skilled in the art that changes and modifications may be made without departing from the invention in its broader aspects, and, therefore, the aim in the appended claims is to cover all such changes and modifications as fall within the true spirit and scope of the invention. Specifically, it should be understood that the manner in which information about the threat, such as an indication of motion or the presence of an identified object, is transmitted to a remote site may be as disclosed above or an alternative known to those skilled in the premise security field. The standards for such an information transmission or communication would be governed by the applicable wireless transmission standards and industry self-regulating groups, if any, in

whatever country the security system is used, e.g., the FCC in the United States.

Claims

1. An alarm system for protecting a structure, comprising:

at least one motion detector arranged to have a field of view external of the structure and including an area proximate the structure;

at least one camera associated with each of said at least one motion detector, each of said at least one camera being arranged relative to the associated one of said at least one motion detector such that said camera has a field of view encompassing at least part of the field of view of the associated one of said at least one motion detector, said at least one camera having a dormant state in which images are not obtained and an active state in which images are obtained and being activated into the active state when the associated one of said at least one motion detector detects motion such that said at least one camera obtains an image of the source of the motion detected by the associated one of said at least one motion detector; and

a processor coupled to said at least one camera and arranged to receive the image obtained by said at least one camera, derive a silhouette of any objects in the image, compare the silhouettes to a library of stored silhouettes having associated object identification to determine an exact or closest match of the derived silhouette to one of the stored silhouettes and retrieve the object identification associated with the exact or closest match, said processor being arranged to react to the detection of motion by said at least one motion detector based on the object identification.

2. The system of claim 1, wherein said at least one motion detector comprises a plurality of motion detectors, said at least one camera associated with said at least one motion

detector being arranged to have a field of view overlapping a field of view of a plurality of said motion detectors.

3. The system of claim 1, wherein said at least one motion detector comprises a plurality of motion detectors and said at least one camera comprises a plurality of cameras.

4. The system of claim 3, wherein at least one of said cameras is associated with at least two of said motion detectors and arranged to have a field of view which also overlaps a field of view of said at least two motion detectors such that said at least one camera is activated into its active state when any of said at least two motion detectors detects motion.

5. The system of claim 3, wherein at least one of said cameras is associated exclusively with each of said motion detectors, at least two of said cameras are associated exclusively with each of said motion detectors or at least two of said cameras are associated non-exclusively with each of said motion detectors, wherein when at least two of said cameras are associated with one of said motion detectors, images from said at least two cameras are analyzed by said processor to determine depth information about an object appearing in the images, the depth information being used in the object identification being performed by said processor.

6. The system of claim 1, wherein said processor is arranged to assign a classification of "no threat" or "hostile" based on the object identification and/or the size of the object, the library of stored silhouettes including silhouettes of large and small animals and large

and small humans and said processor is programmed to assign the hostile classification to large animals and humans and the no threat classification to small animals and humans.

7. The system of claim 6, wherein when said processor assigns a hostile classification, said processor is further arranged to activate countermeasures based on the object identification.

8. The system of claim 6, further comprising an audible and/or visual alarm system adapted to be arranged in connection with or surrounding the structure, said processor being coupled to said alarm system and when said processor assigns a hostile classification, said processor further is arranged to command said alarm system to generate the audible and/or visual alarm.

9. The system of claim 6, further comprising a communications system for generating communications and forwarding the communications to a remote destination, said processor being coupled to said communications system and when said processor assigns a hostile classification, said processor further is arranged to command said communications system to generate a communications about the condition of the structure and forward the communication to the remote destination.

10. The system of claim 9, wherein the remote destination is a police station, a fire station, a terminal monitored by an owner of the structure, or a private security station.

11. The system of claim 9, wherein said processor provides said communication system with one or more images obtained from said at least one camera or one or more images derived from the images obtained from said at least camera and said communication system being arranged to include the one or more images into the communications being forwarded to the remote destination.

12. The system of claim 1, further comprising:

a telecommunications module coupled to said at least one motion detector, said telecommunications module being capable of communications over a telecommunications network; and

a handheld telecommunications unit for transmitting commands to said telecommunications module to activate and deactivate said at least one motion detector.

13. A method for protecting a structure, comprising:

arranging a plurality of motion detectors on or around the structure, each in a position in which its field of view includes an area proximate the structure;

arranging a plurality of cameras on or around the structure, each camera being associated with one or more of the motion detector such that the camera has a field of view encompassing at least part of the field of view of any associated motion detector, the cameras having a dormant state in which images are not obtained and an active state in which images are obtained and being activated into the active state when an associated motion detector detects motion such that

the camera then obtains an image of the source of the motion detected by the associated motion detector;

providing a processor which receives images obtained by the cameras, derives a silhouette of any objects in the image, compares the silhouettes to a library of stored silhouettes having associated object identification to determine an exact or closest match of the derived silhouette to one of the stored silhouettes and retrieves the object identification associated with the exact or closest match; and

generating a countermeasure to the detection of motion by the motion detectors based on the object identification when the object is identified as a potential threat to the structure.

14. The method of claim 13, wherein each camera is associated with only a single motion detector, each camera is associated with a plurality of motion detectors or multiple cameras are associated with each motion detector, wherein when a plurality of cameras are associated with one of the motion detectors, images from the plurality of cameras are analyzed by the processor to determine depth information about an object appearing in the images, the depth information being used in the object identification being performed by the processor.

15. The method of claim 13, further comprising assigning a classification of "no threat" or "hostile" based on the object identification and/or the size of the object, the countermeasure being generated only when the classification is hostile.

16. The method of claim 13, wherein the step of generating countermeasures includes

generate an audible and/or visual alarm in proximity to the structure or generating at least one communication about the condition of the structure based on the object identification and forwarding the communication to the remote destination.

17. The method of claim 16, wherein the remote destination is a police station, a fire station, a terminal monitored by an owner of the structure, or a private security station.

18. The method of claim 16, further comprising including one or more images obtained from the cameras or one or more images derived from the images obtained from the cameras in the communication being forwarded to the remote destination.

19. The method of claim 13, further comprising;

integrating a telecommunications module in connection with the processor, the telecommunications module being capable of communications over a telecommunications network; and

programming the telecommunications module to receive commands from a handheld telecommunications unit over the telecommunications network to enable activation and deactivation of the motion detectors and cameras using the telecommunications unit.

20. An alarm system for protecting a structure, comprising:

at least one image obtaining unit arranged to have a field of view external of the structure and including an area proximate the structure, said at least one image obtaining unit being

arranged to obtain images and detect motion based on analysis of the obtained images, said at least one image obtaining unit having a first state in which images are not analyzed for identification purposes and a second state in which images are analyzed for identification purposes and being activated into the second state when motion is detected; and

a processor coupled to said at least one image obtaining unit and arranged to receive the image obtained by said at least one image obtaining unit, derive a silhouette of any objects in the image, compare the silhouettes to a library of stored silhouettes having associated object identification to determine an exact or closest match of the derived silhouette to one of the stored silhouettes and retrieve the object identification associated with the exact or closest match, said processor being arranged to react to the detection of motion by said at least one image obtaining unit based on the object identification.

21. The system of claim 20, wherein said processor is arranged to assign a classification of "no threat" or "hostile" based on the object identification and/or size of the object, the library of stored silhouettes including silhouettes of large and small animals and large and small humans and said processor is programmed to assign the hostile classification to large animals and humans and the no threat classification to small animals and humans.

22. The system of claim 21, further comprising a communications system for generating communications and forwarding the communications to a remote destination, said processor being coupled to said communications system and when said processor assigns a hostile classification, said processor further is arranged to command said communications system

to generate a communications about the condition of the structure and forward the communication to the remote destination.

Abstract

Security system which includes motion detectors connected to cameras which are connected to a computer which is connected to a data communication device that informs a homeowner off-premises, the police, fire department and/or private security firm of the existence of an intrusion condition based on the images obtained by the camera. The motion detector detects motion in the field of view of an associated camera which then obtains images. A processor connected with the camera derives a silhouette of an object that triggered the motion from the obtained image(s). The silhouettes are compared to previously obtained silhouettes, such as those of various animals and humans having different sizes. A classification of the silhouette is obtained and depending on what object the silhouette is determined to correspond to, i.e., its identification, further action or countermeasures is taken. Control of the security system may be via a handheld telecommunications device.

Attorney Docket No. 126.107

UNITED STATES PATENT AND TRADEMARK OFFICE

Re:	Application of:	Mark Dronge et al.
	Serial No.:	Not yet known
	Filed:	March 28, 2007
	For:	SECURITY ALARM SYSTEM
	Customer Number:	22846

SUBMISSION OF APPLICATION FOR FILING DATE WITHOUT SIGNED DECLARATION AND WITHOUT FEE

Mail Stop Patent Application
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

March 28, 2007

Dear Sir:

In accordance with 37 C.F.R. §1.53, there is submitted herewith for filing in connection with the above-referenced application and in accordance with 37 C.F.R. §1.53(b) for assignment of a serial number and filing date, the following:

1) specification containing a description pursuant to 37 C.F.R. §1.71 and at least one claim pursuant to 37 C.F.R. §1.75; and

2) four (4) sheet of drawings.

This application is not accompanied by a signed Declaration or Oath and Power of Attorney. However, a Declaration and Power of Attorney will be submitted upon receipt of a Notice to File Missing Parts. The Declaration may identify the following inventors:

Mark DRONGE

David AMELS

The Declaration will appoint the undersigned as attorney.

Brian Roffe, Esq.

Customer Number 22846

The appropriate filing fee is not enclosed. However, the filing fee will be submitted at a later date.

FOR THE APPLICANTS
Respectfully submitted,

/Brian Roffe/

Brian Roffe
Reg. No. 35,336

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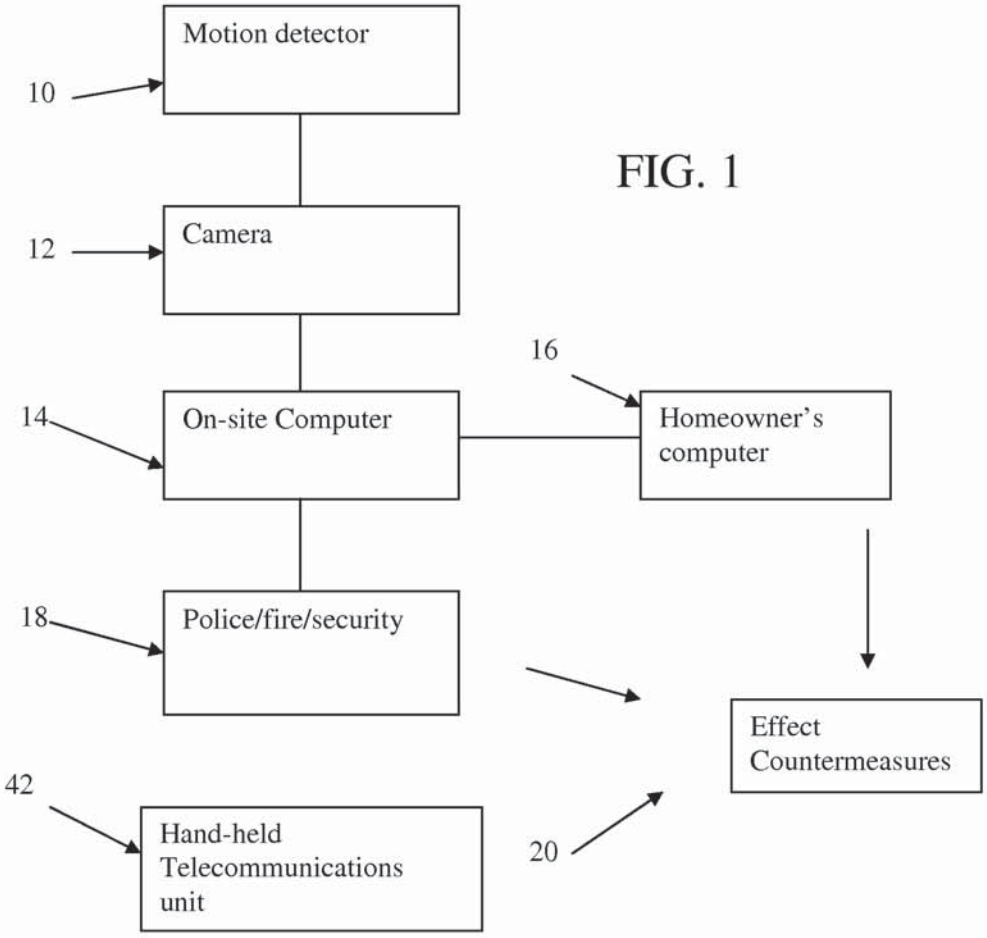

Motion detector
10
Camera
12
16
On-site Computer
14
Homeowner's computer
Police/fire/security
18
Effect Countermeasures
42
Hand-held Telecommunications unit
20

FIG. 1

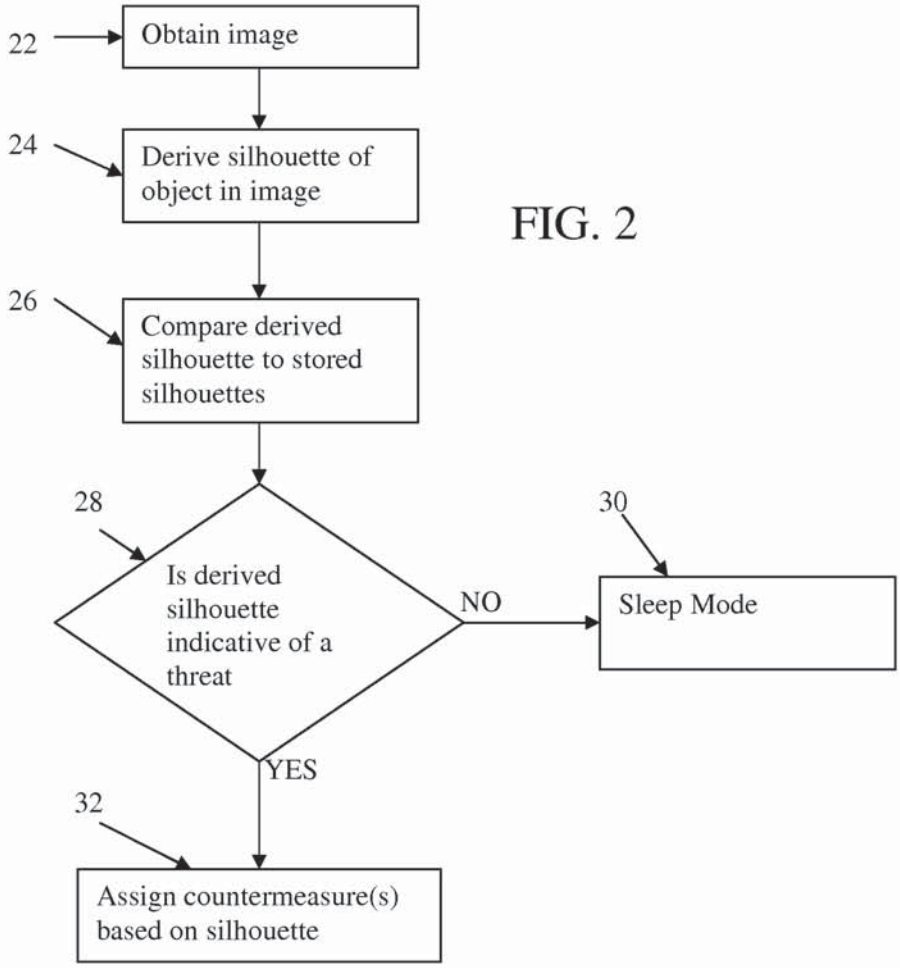

22
Obtain image
24
Derive silhouette of object in image
26
Compare derived silhouette to stored silhouettes
28
Is derived silhouette indicative of a threat
NO
30
Sleep Mode
YES
32
Assign countermeasure(s) based on silhouette

FIG. 2

FIG. 3

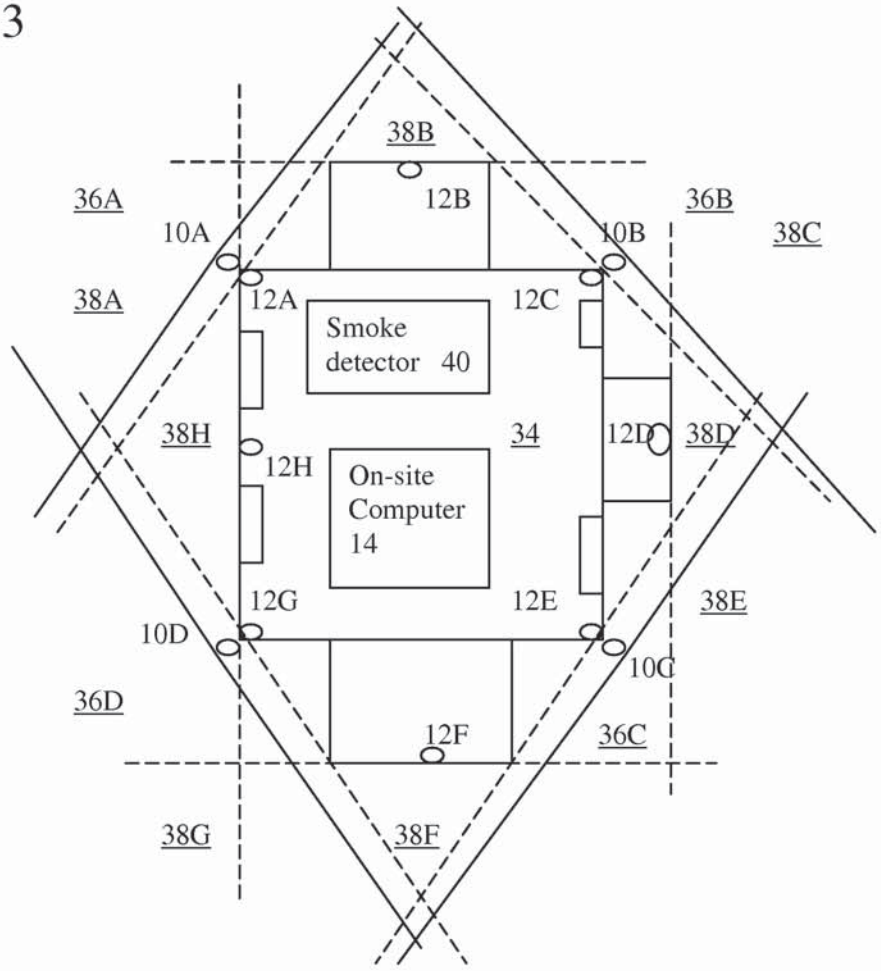
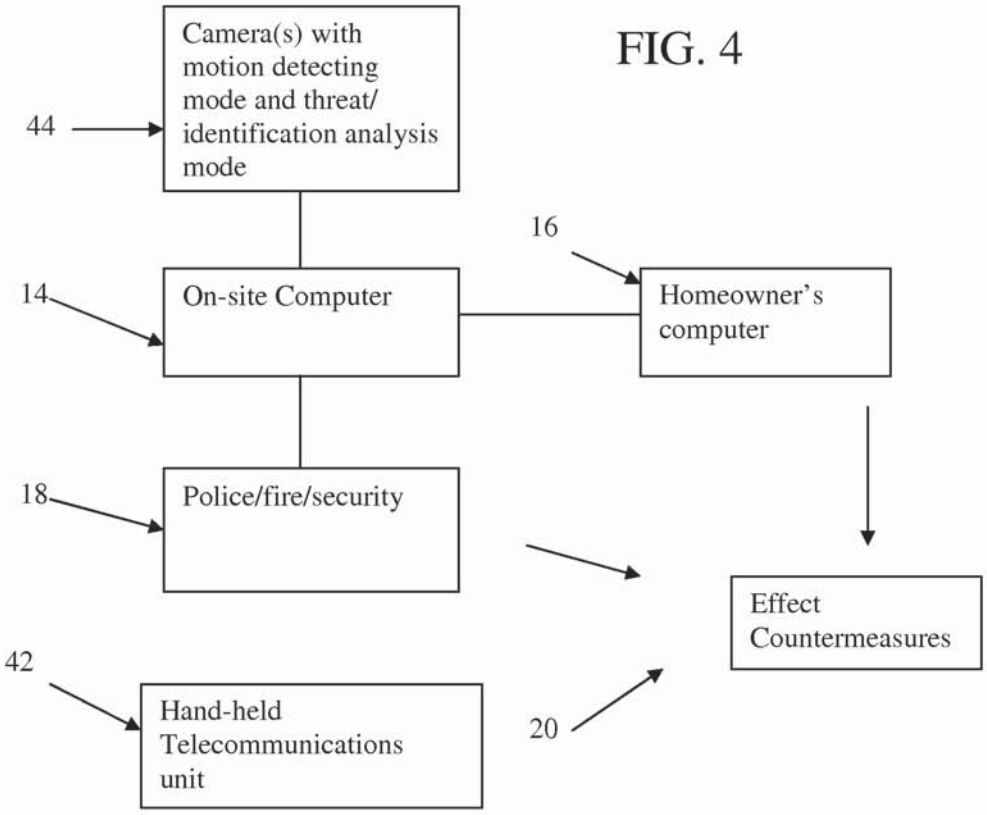

38B
36A
12B
36B
10A
10B
38C
38A
12A
12C
Smoke
detector 40
38H
34
12D
38D
12H
On-site
Computer
14
12G
12E
38E
10D
10C
36D
12F
36C
38G
38F

FIG. 4


Camera(s) with motion detecting mode and threat/ identification analysis mode
44
16
On-site Computer
14
Homeowner's computer
18
Police/fire/security
Effect Countermeasures
42
Hand-held Telecommunications unit
20

Electronic Acknowledgement Receipt

EFS ID:	1631751
Application Number:	11692430
International Application Number:	
Confirmation Number:	7545
Title of Invention:	SECURITY ALARM SYSTEM
First Named Inventor/Applicant Name:	Mark Dronge
Customer Number:	22846
Filer:	Brian Roffe
Filer Authorized By:	
Attorney Docket Number:	126.107
Receipt Date:	28-MAR-2007
Filing Date:	
Time Stamp:	14:33:14
Application Type:	Utility

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)	Multi Part /.zip	Pages (if appl.)
1		New-Application-126-107-specification.pdf	120873	yes	34

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Specification	1	25
	Claims	26	33
	Abstract	34	34

Warnings:					
Information:					
2	Miscellaneous Incoming Letter	New-Application-126-107-application-submission.pdf	16869	no	2
Warnings:					
Information:					
3	Drawings	New-Application-126-107-drawings.pdf	15453	no	4
Warnings:					
Information:					
		Total Files Size (in bytes):	153195		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/06 (12-04)
Approved for use through 7/31/2006. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 11/692,430

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY FEE ($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))							300
SEARCH FEE (37 CFR 1.16(k), (i), or (m))							500
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))							200
TOTAL CLAIMS (37 CFR 1.16(i))	22 minus 20 =	* 2	X$ 25=		OR	X$50=	100
INDEPENDENT CLAIMS (37 CFR 1.16(h))	3 minus 3 =	*	X$100=			X$200=	
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR						
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))			N/A			N/A	
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	1100

APPLICATION AS AMENDED – PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE ($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	X =		OR	X =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X =		OR	X =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					N/A		OR	N/A	
						TOTAL ADD'T FEE		OR	TOTAL ADD'T FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)	OR	RATE ($)	ADDITIONAL FEE ($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	X =		OR	X =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X =		OR	X =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					N/A		OR	N/A	
						TOTAL ADD'T FEE		OR	TOTAL ADD'T FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.